entrol H11
EC-135 - FNPT II MCC
Technical Specifications

CS-FSTD (H) Flight Navigation & Procedures Trainer

Rev 1.1

REVISION CONTROL			
REV	DATE OF REV	REMARKS	APPROVED
1.0	24/11/14	FIRST EDITION	LOS
1.1	04/12/14	FINAL EDITON	LOS

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1 Introduction

entrol develops and manufactures fixed-wing and helicopter CS-FSTD approved flight simulators, FNPT and FTD, for civilian and mission training, in order to increase security on aircraft operations and reduce operational costs.

Our simulators are designed according to CS-FSTD and FAA FTD directives. We give support for the certification and provide maintenance throughout the simulator's life.

entrol simulators are reference in the market thanks to their realistic and fully functional cockpits, which replicate very accurately the reference aircraft. They have all systems operative and simulated. We perform tests on the real aircrafts to obtain the validation data for our flight models.

1.1 entrol Simulators Portfolio

entrol continuously works to update and increase the portfolio of simulators offered. In case that our simulators do not satisfy your needs or do not fit your fleet of aircraft, contact us to ask for a quotation to simulate your type of aircraft.

1.1.1 Helicopter Simulators

entrol has certified several helicopters types at different levels. The list of helicopters that we can offer at the moment is the following:

Type of Aircraft	**Certification Level**
Bell 206 Jet Ranger	FNPT II
EC-135	FNPT II MCC
AS 365 N3 Dauphin	FNPT II MCC
EC-155	FNPT II MCC
Bell 429	FNPT II MCC
Bell 412	FNPT II MCC

1.1.2 Airplane Simulators

Type of Aircraft	**Certification Level**
Piper Seneca	FNPT II
Socata TB20	FNPT II
A11 Mix Reconfigurable	FNPT II – FNPT II MCC
Beechcraft C90 GTi	FNPT II MCC
Beechcraft B200 GT	FNPT II MCC
Twin Jet Engine	FNPT II MCC

2 EC-135 FNPT II MCC Simulator Overview

The entrol H11/ EC-135 simulator FNPT II MCC replicates very accurately the EC-135 helicopter cockpit and flight behaviour. It has all systems operative and simulated. We have performed tests on the real aircraft to obtain the validation data for our MQTG.

2.1 Cockpit, flight controls and systems based on the EC-135

- **Glass Cockpit Configuration**
- **Dual pilot IFR Configuration**
- **Multi Engine Cat A helicopter**
- Flight Control Loading System in cyclic and pedals with **digitally controlled engines**
- Dual Interlinked Cyclic and Collective
- Twist Grips for Manual FADEC Control
- **4 Axis Autopliot with upper modes**
- **Radar: Wx and ARA**
- OffShore operation systems: Adelt, AHRS
- TCAS I

- FMS based on CDU UNS-1D
- P2+
- TCPIP Sensing Technology
- All panels backlight

2.2 3 Channel cylindrical visual 150º x 40º

- Total immersion during the exercise on the simulator
- Full HD Projectors
- Warping and edge blending included

2.3 Worldwide database with SID/STAR approaches

- **The terrain database will contain defined airfields released in Estonian AIP and cover their normal and geographical specifications**
- Additionally the entrol Standard Airport & Navigation database will be installed. It covers the navigation aids, waypoints, ILS, VOR, NDB and airports of most of Europe
- Geographical features are easily recognizable such as mountains, coastlines and urban areas
- SID/STAR airport approaches of Heathrow, Barajas, Schiphol, Estambul, Paris and many others are included

2.4 Enclosed instructor station with two 24" tactile screens

- **Two 24" tactile screens with an intuitive and easy interface**
- Failures organized by systems easily activated
- Weight and balance, fuel quantity, ZFW,..
- Atmospheric and visual conditions can be changed in real time
- Lateral and vertical approach view
- Automatic QTG's on the Instructor Station that can be printed and saved
- Approach Plates of the defined airports with the position of the aircraft over the page

2.5 Modular and transportable in case of necessity:

- **The simulator can be installed in a room of 5,5 x 5 x 3,1**
- Installation in one week by entrol staff
- It is modular and transportable in case of necessity

2.6 Video of the entrol H11

You can watch a **video of the entrol H11** in our **Youtube channel:**

https://www.youtube.com/watch?v=-dMq8I_TA9c

3 EC-135 FNPT II MCC Simulator Training Solutions

The EC-135 FNPT II MCC simulator provides solutions to a wide range of training needs:

3.1 Certified simulator for Modular & Integrated courses

- PPL / CPL / ATPL
- MCC
- IR-ME
- FI / IRI / MCCI / STI

3.2 Additional training

- Additional training programs based on the EC-135:
  - EC-135 Cockpit Familiarization
  - EC-135 Normal & Emergency Procedures Refreshment
  - Systems Training
- Human Factors and Pilots Decision-Making Courses:
  - CRM (Crew Resource Management)
  - TEM (Threat and Error Management)
- LOFT (Line Oriented Flight Training)
- Initial Pilot Evaluation

3.3 Offshore Operation Training

- Equipment for Offshore Operation: **The cockpit is equipped for offshore operation training**
- The database includes oil rigs with helipads. They can be placed anywhere in the world according to the customer needs

3.4 Mission Training

- Optionally COTS elements can be added to the EC-135 FNPT II MCC for Mission Training. You will be able to train a wide range of operations:
  - Patrol / Border Control / Fire Fighting
  - SAR / EMS
  - ...

4 entrol Services

Due our commitment with quality we try to offer the best solutions. For this reason we work hard to provide the best service to our customers:

4.1 Turnkey solution

- 36 months warranty for all the parts and components of the simulator
- **Shipping, installation, insurance & testing by entrol staff on customer premises**
- **Maintenance technicians and instructors training**
- **All documentation provided**: MQTG, Instructor Manual, Maintenance manual, Flight Manual...
- **Toolbox** with all the tools necessary to perform normal maintenance of the simulator
- **Spare Part Set** for basic elements of the simulator

4.2 Certification support

- **Assistance to the initial certification for FNPT II MCC on customer premises**
- Commitment with the certification: **20% of the payment upon FNPT II MCC certification**
- The simulator is delivered with a “Qualification Test Guide (QTG)
- **Automatic QTG's on the Instructor Station can be printed and saved**

4.3 Optional Maintenance services contract

- **Yearly visit for recurrent certification assistance and system check**
- Remote maintenance
- Telephonic assistance
- System and navigation database quarterly updates
- Documentation management service
- Optional Spare Parts: We define an optional spare part list that the customer can have on-site

4.4 Upgradable solution

- Possibility of adding new improvements after the simulator installation:
  - Spherical Visual
  - High resolution databases / New airports and countries

5 EC-135 FNPT II MCC Simulator Technical Characteristics

The device and its components will be new, not overhauled and not used before.

The simulator will have crew member seats with ample for-aft and vertical adjustment range to achieve authentic eye reference and ergonomic seating position for trainees with various heights

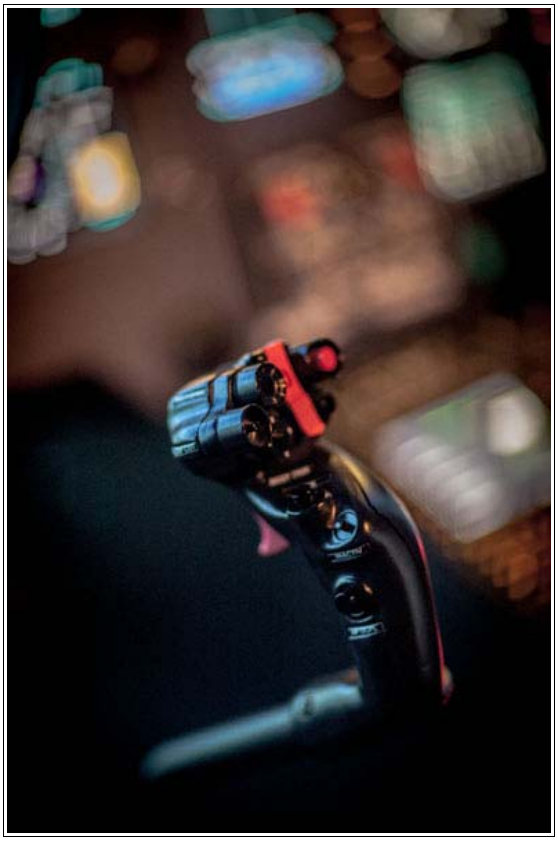
5.1 Flight Controls

- Dual flight controls are installed
- Cyclic and Collective Grip will have the necessary buttons and switches for simulation
- The forces, travel and operation of the flight controls is similar to the helicopter, complying with the FSTD H, FNPT II requirements
- Pilot and co-pilot controls are mechanically connected
- Pitch, Roll and Yaw Axises have a control loading system (CLS) with electrical engines with digital controllers
- All engines have reverse current dissipators (shunts)

entrol H11

5.1.1 Cyclic Grip Controls

- ICS Radio
- FTR/TRIM REL
- BPP/ATT TRIM
- SAS/AP CUT
- SAS RST
- CDS/AUDIO RES



entrol H11 cyclic

5.1.2 Collective Grip Controls

Collective lever has an adjustable friction control. The Collective has both Eng1 and Eng2 grips for Manual throttle control:

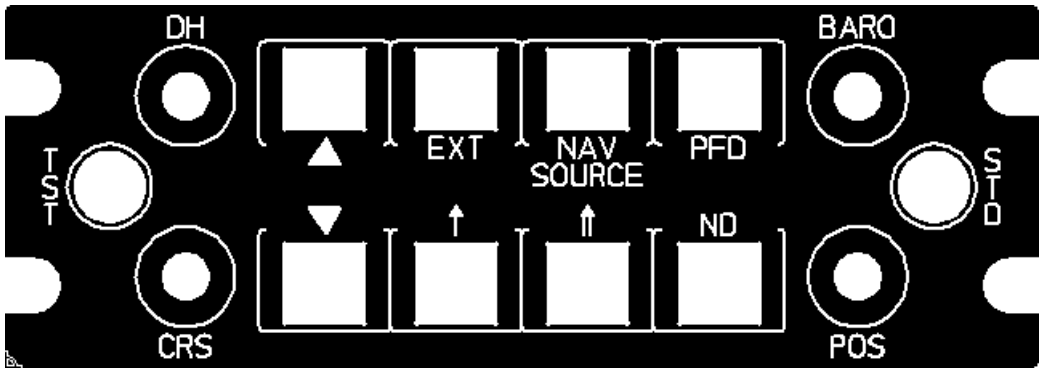
- FILL FLOATS
- ENG TRIM
- LFD LT FIX
- WIPER
- AP GA
- LDG LT
- LT/MIR

entrol H11 collective

5.2 Pedestal

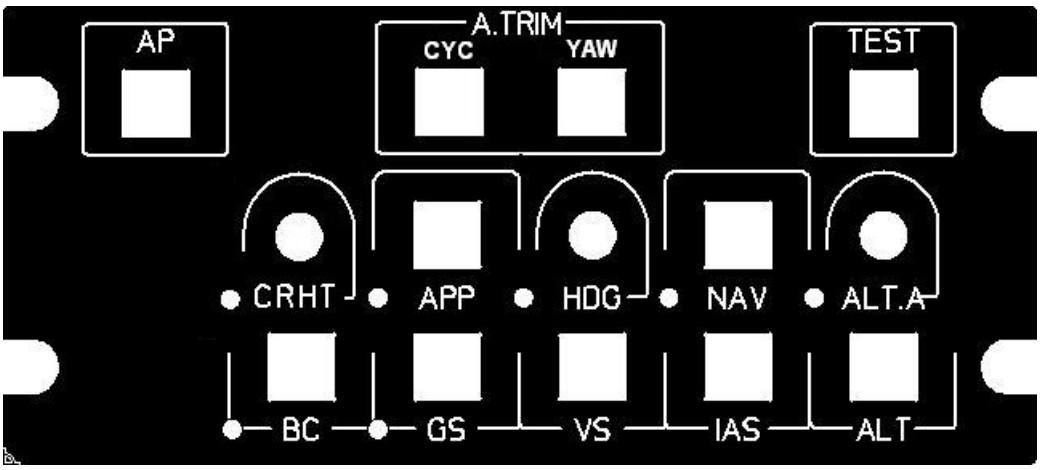
A Pedestal with all the instruments and panels replicating the disposition of EC-135 is installed. The disposition and panels installed are the following:

1.1.1. ICP 1 – ICP 2

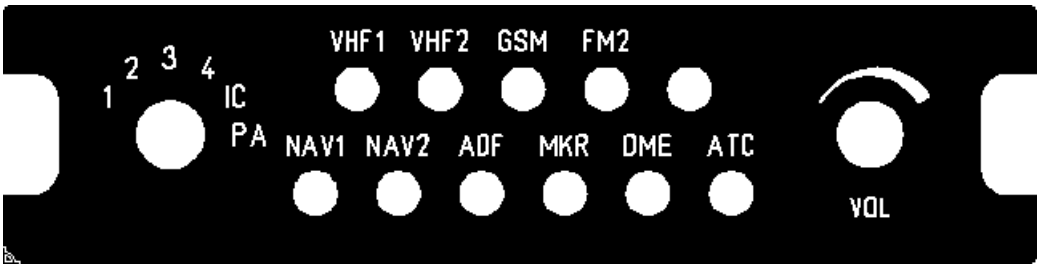


1.1.2. One CDU based on UNS-1D

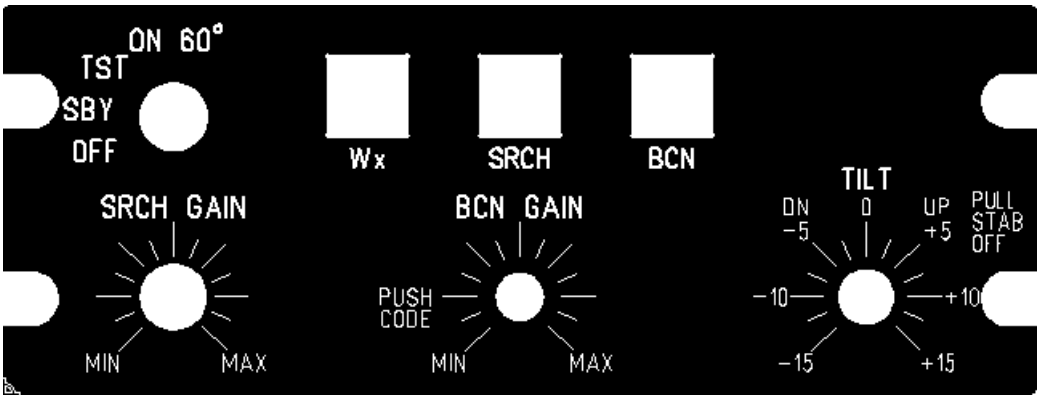
1.1.3. APMS



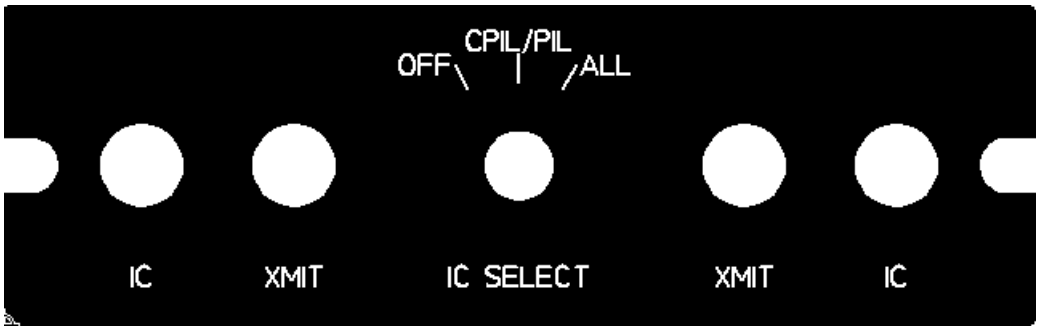
1.1.4. ICS 1 – ICS 2



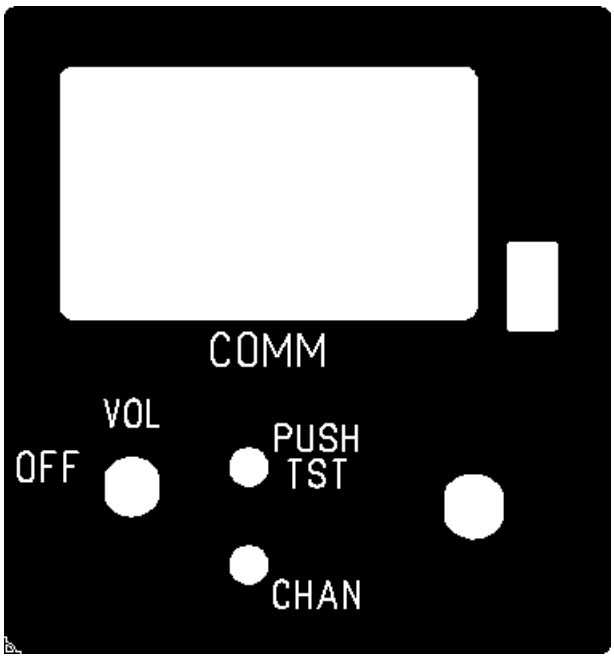
1.1.5. Radar: Wx and ARA for approach procedure training

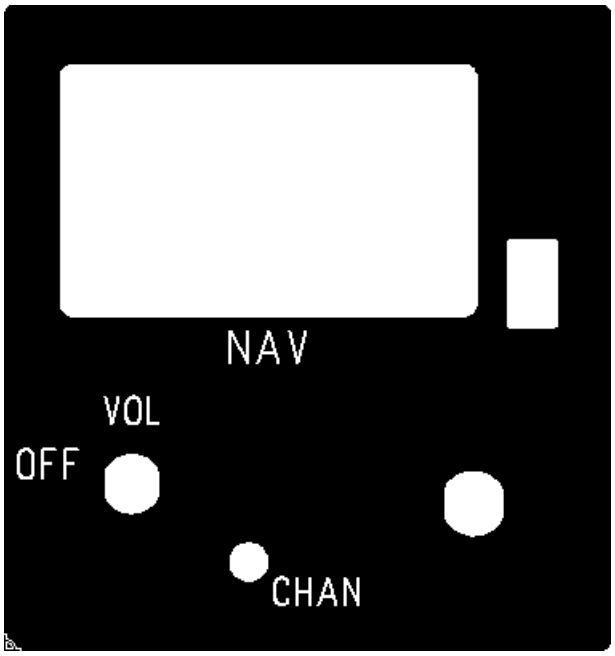


1.1.6. EMER

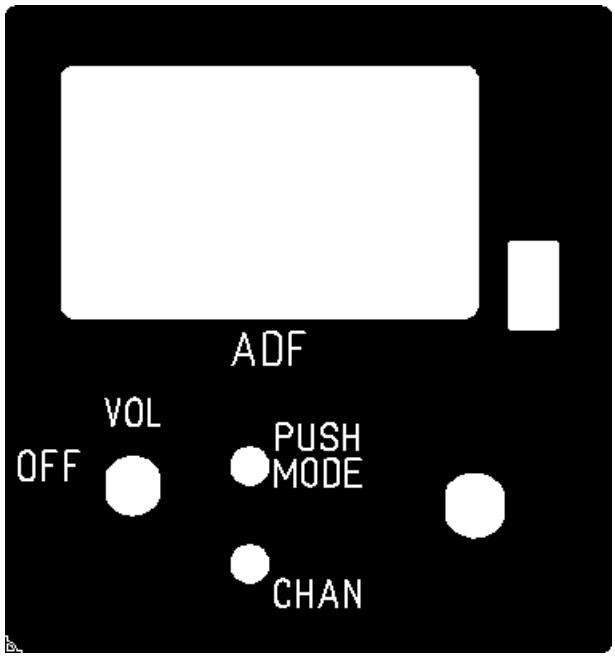


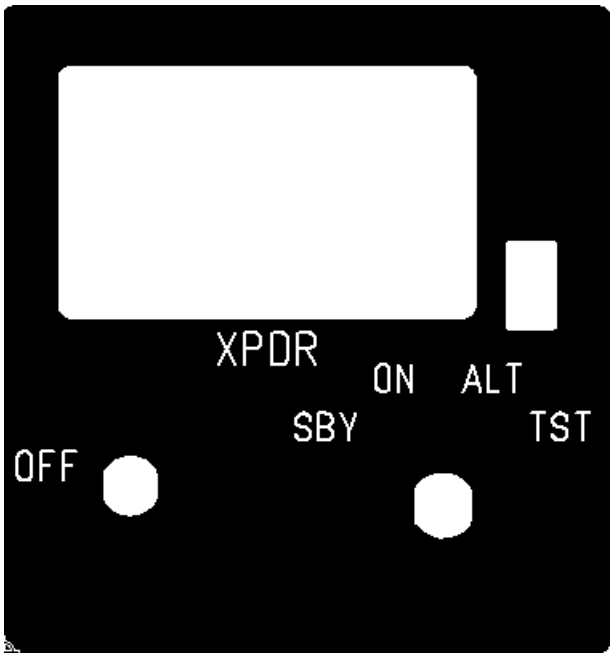
1.1.7. VHF COMM/NAV 1 - VHF COMM/NAV 2



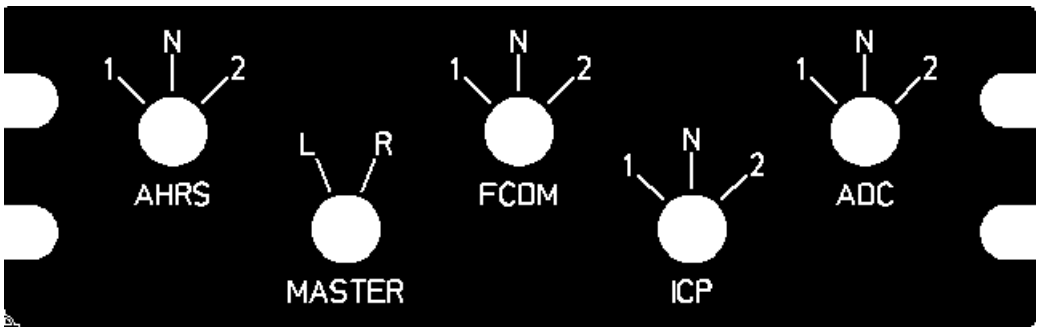


1.1.8. ADF/XPDR



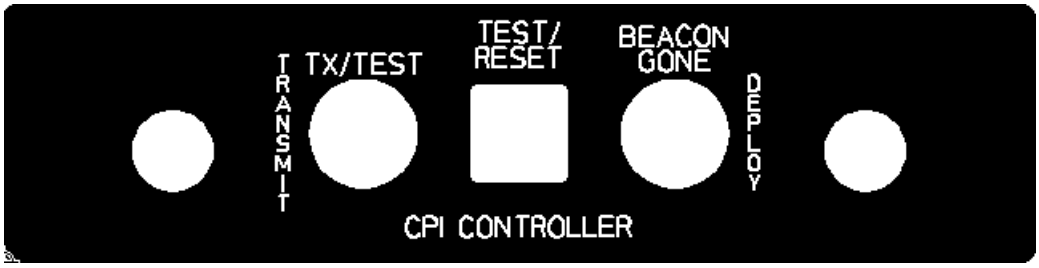


1.1.9. RCU



1.1.10. AHRS

1.1.11. ADELT



1.1.12. AIR / HTG CONTROL levers

Pedestal Panels Layout

<table>
<tr><td colspan="2">ICP 1</td><td colspan="2">ICP 2</td></tr>
<tr><td colspan="2" rowspan="2">CDU UNS-1</td><td colspan="2">APMS</td></tr>
<tr><td>COMM 2</td><td>NAV 2</td></tr>
<tr><td colspan="2">ICS 1</td><td colspan="2">ICS 2</td></tr>
<tr><td>COMM 1</td><td>NAV 1</td></tr>
<tr><td>ADF</td><td>XPDR</td></tr>
<tr><td colspan="2">WX RADAR</td></tr>
<tr><td colspan="2">AHRS</td></tr>
<tr><td colspan="2">EMER</td></tr>
<tr><td colspan="2">RCU</td></tr>
<tr><td colspan="2">ADELT</td></tr>
</table>

AIR / HTG CONTROL

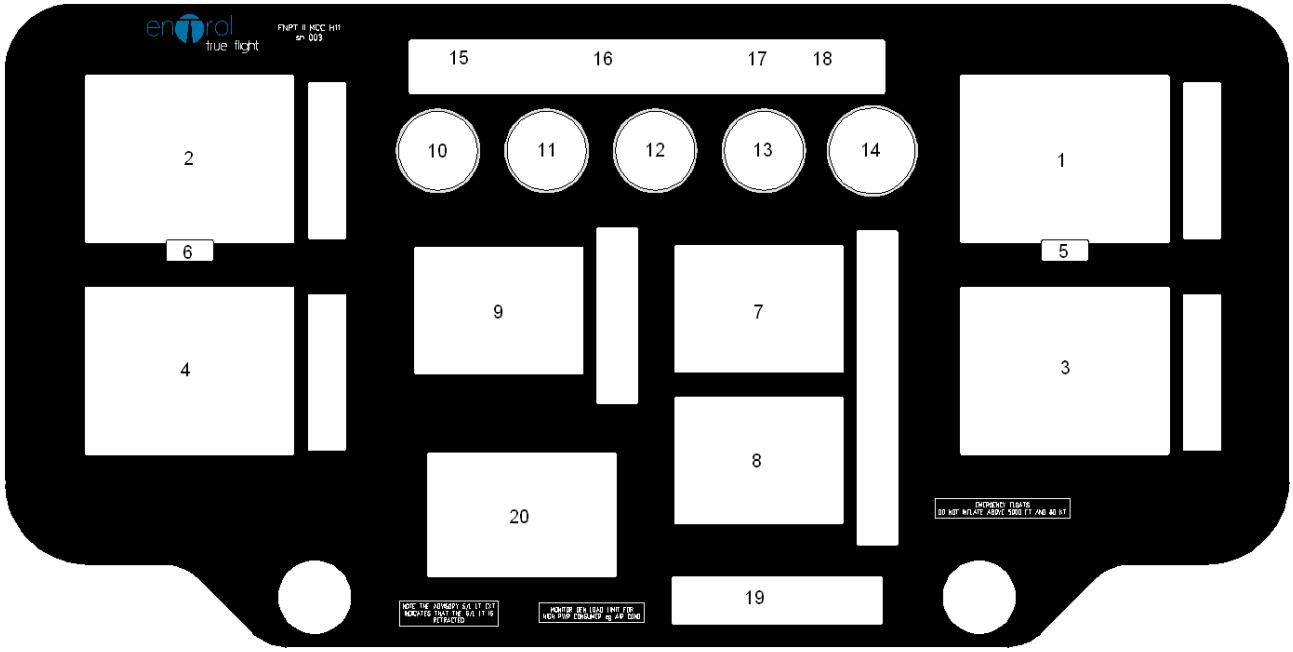
entrol H11 pedestal

5.3 Center Console

All the switches and controls are installed on the center console. They are located in their correct position with the engraved legends. All are sensed and actuate on the corresponding system.

The displays and systems are the following:

entrol H11 Center Console



1. Pilot PFD 2. Copilot PFD 3. Pilot ND 4. Copilot ND 5. Pilot slip indicator 6. Copilot slip indicator 7. Upper VEMD 8. Lower VEMD 9. CAD 10. Clock / Timer 11. Anemometer 12. Attitude indicator 13. Barometric altimeter	14. Triple tachometer 15. EMER OFF SW 1 and warning FIRE pushbutton 16. Warning panel 17. EMER OFF SW 2 and warning FIRE pushbutton 18. MASTER CAUTION indicator 19. CAT A Pushbutton 20. ENG / DC PWR panel - GEN I, BAT MSTR y GEN II switches - MASTER and FADEC ENG I switches - MASTER and FADEC ENG II Switches

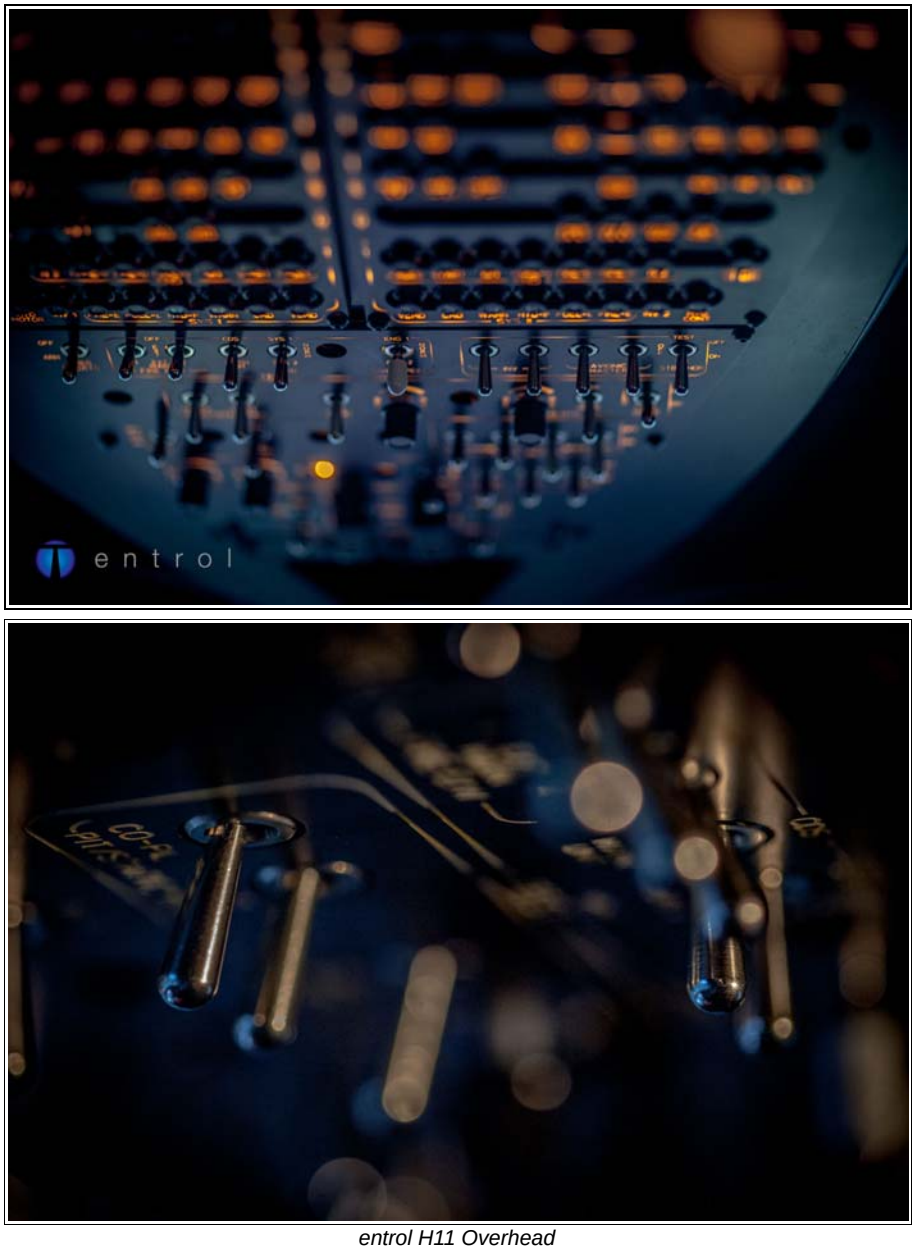
entrol H11 lateral view

5.4 Overhead Panel

The overhead panel replicates the operation and disposition of the EC-135. It has the following sections:

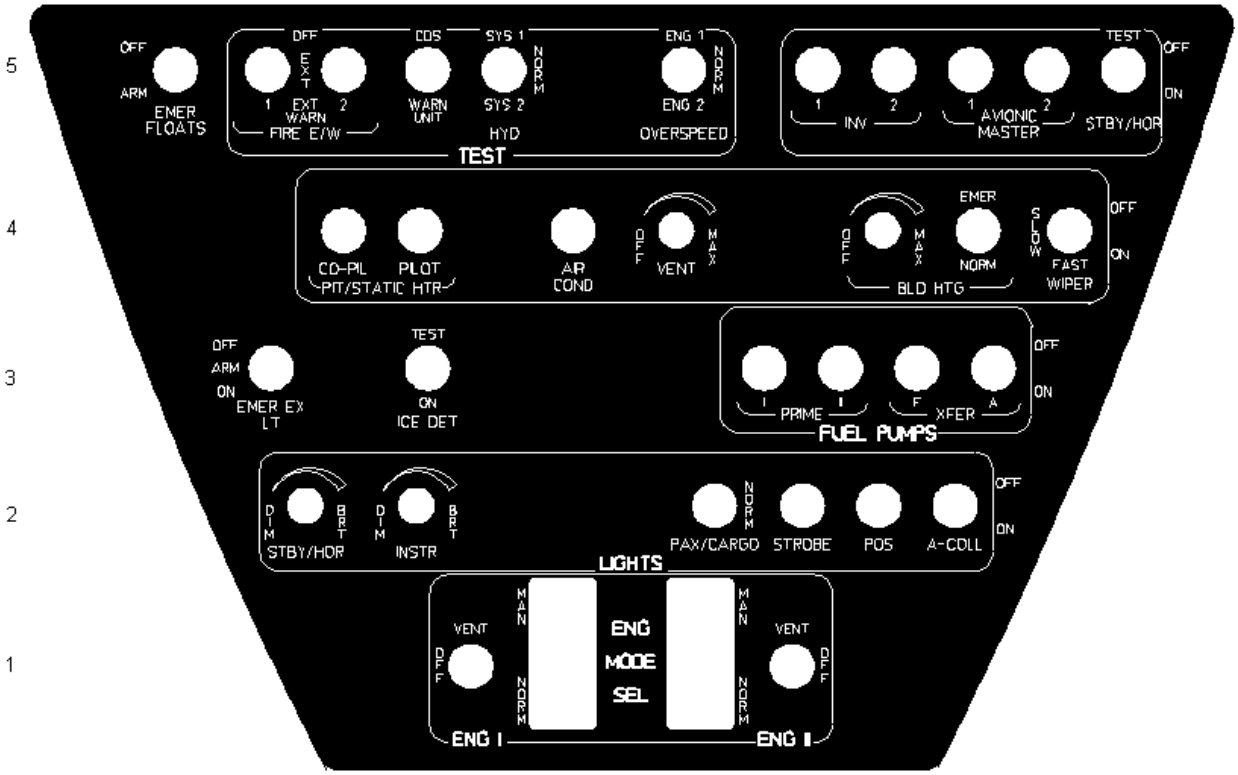
- Rotor brake lever at the front
- Switch panel in the middle
- Circuit breakers panel I and II at the back

All the breakers and switches are sensed and operational. Eight of the breakers simulate a short circuit and they can be activated through the Instructor's Station.



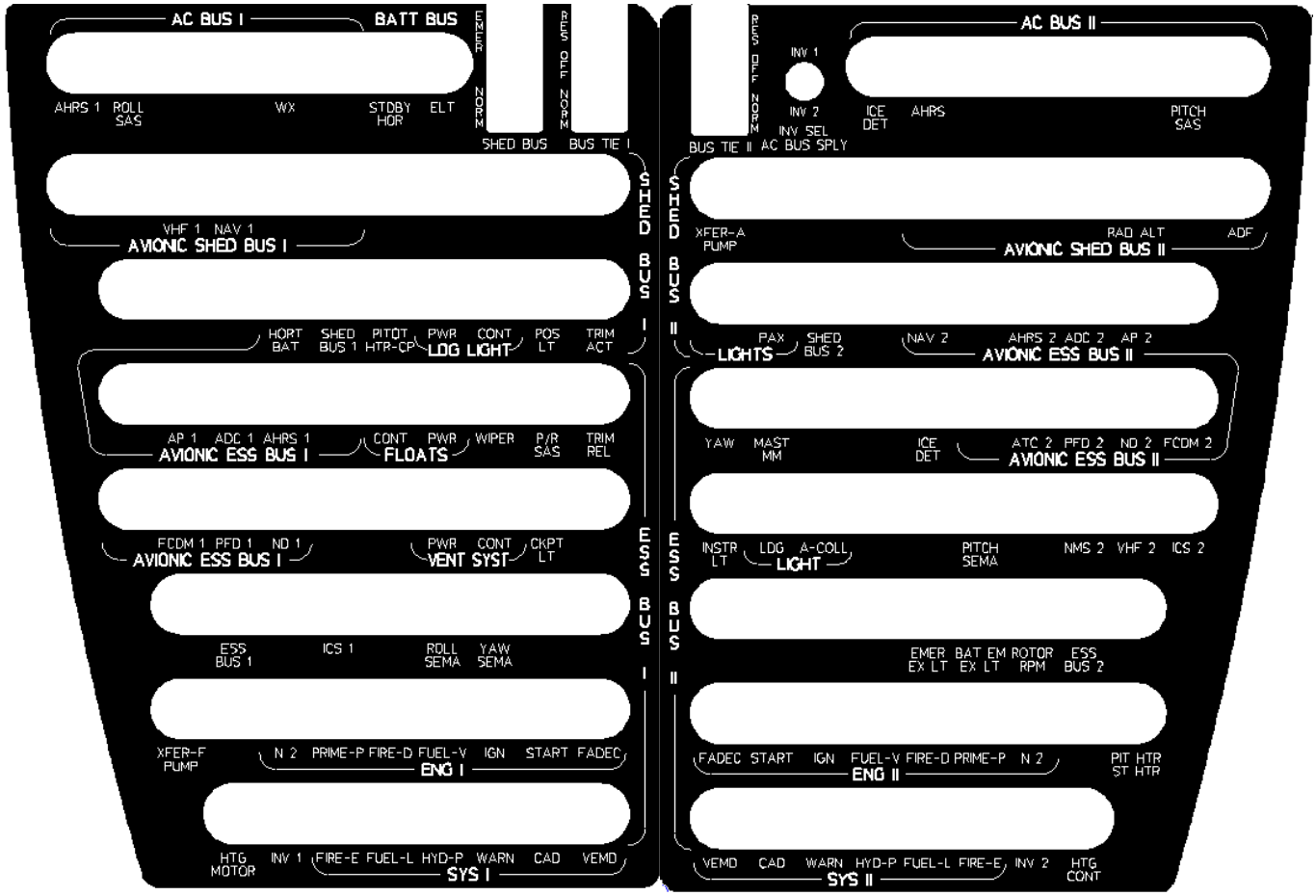
entrol H11 Overhead

OVERHEAD PANEL FRONT SWITCH ROWS



1. ENG LINE: a. VENT ENG I switch b. MODE SEL ENG I switch c. MODE SEL ENG II switch d. VENT ENG II switch 2. LIGHTS LINE : a. STBY/HOR rheostat b. INSTR rheostat c. PAX/CARGO switch d. STROBE switch e. POS switch f. A-COLL switch 3. FUEL PUMPS LINE: a. EMER EX LT switch b. TEST ICE DET switch c. PRIME I switch d. PRIME II switch e. XFER I switch f. XFER II switch	4. HTG / AIR COND LINE: a. PITOT STATIC HTR COP switch b. PITOT STATIC HTR PIL switch c. AIR COND switch d. VENT rheostat e. BLD HTG rheostat f. EMER BLEED HTG switch g. WIPER switch 5. TEST / AVIONIC LINE: a. EMER FLOATS switch b. TEST FIRE E/W 1 switch c. TEST FIRE E/W 2 switch d. TEST CDS/WARN UNIT switch e. TEST HYD switch f. TEST OVERSPEED switch g. INV 1 switch h. INV 2 switch i. AVIONIC MASTER 1 switch j. AVIONIC MASTER 2 switch k. STBY/HOR switch

OVERHEAD PANEL AFT BREAKER ROWS



6. a. HTG MOTOR b. INV 1 c. SYS I FIRE-E d. SYS I FUEL-L e. SYS I HYD-P f. SYS I WARN g. SYS I CAD h. SYS I VEMD i. SYS II VEMD j. SYS II CAD k. SYS II WARN l. SYS II HYD-P m.SYS II FUEL-L n. SYS II FIRE-E o. INV 2 p. HTG CONT 7. a. XFER-F PUMP b. ENG I N2 c. ENG I PRIME-P d. ENG I FIRE-D e. ENG I FUEL-V f. ENG I IGN g. ENG I START h. ENG I FADEC i. ENG II FADEC	j. ENG II START k. ENG II IGN l. ENG II FUEL-V m. ENG II FIRE-D n. ENG II PRIME-P o. ENG II N2 p. PIT HTR / ST HTR 8. a. ESS BUS 1 b. ICS 1 c. ROLL SEMA d. YAW SEMA e. EMER EX LT f. ROTOR RPM g. ESS BUS 2 9. a. FCDM 1 b. PFD 1 c. ND 1 d. VENT PWR e. VENT CONT f. CKPT LT g. INSTR LT h. LDG LT i. A-COLL j. PITCH SEMA	k. NMS 2 l. VHF 2 m. ICS 2 10. a. AP 1 b. ADC 1 c. AHRS 1 d. FLOATS CONT e. FLOATS PWR f. WIPER g. P/R SAS h. TRIM REL i. YAW j. MAST MM k ICE DET l. ATC 2 m. PFD 2 n. ND 2 o. FCDM 2 11. a. HOR BAT b. SHED BUS 1 c. PITOT HTR-CP d. LDG LT PWR e. LDG LT CONT f. POS LT	g. TRIM ACT h. PAX LT i. SHED BUS 2 j. NAV 2 k. AHRS 2 l. ADC 2 m. AP 2 12. a. VHF 1 b. NAV 1 c. XFER-A PUMP d. RAD ALT e. ADF 13. a. AHRS 1 b. ROLL SAS c. WX d. STBY HOR e. ELT f. SHED BUS switch g. BUS TIE I switch h. BUS TIE II switch i. INV SEL AC BUS SPLY switch j. ICE DET k. AHRS 2 l. PITCH SAS m. P/R SAS

6 Visual: 3 Channel Cylindrical 150º x 40º Full HD

The H11 is equipped with a 3 Channel Cylindrical External Front Visual Projection with Full HD Projectors.

entrol H11 IOS view

6.1 Visual Characteristics

- **The field of view is 150 degrees horizontal and 40 degrees vertical**
- **Front Projection**
- **Warping and edge blending software**
- **Obstacle sensing logic: It is not possible to fly through buildings, trees, etc in the defined enclosed area.**
- The visual screen is cylindrical and continuous, with a radius of 2.50 meters to give an appropriate sensation of depth
- Full HD projectors 1920x1080
- The visual system has a min 3000:1 contrast value
- The flight is synchronized with cockpit instruments
- RVR control in meters
- Black Level adjustment
- The visual let see the airport environment appropriately
    - Runway airport definition, strobe lights and approach lights
    - Markings and textures on runways, taxiways and ramps
    - **Day/dusk/dawn/night modes**
    - Proper color lighting in landing area, including runway edges and centerline
    - Approach systems FATO/TLOF

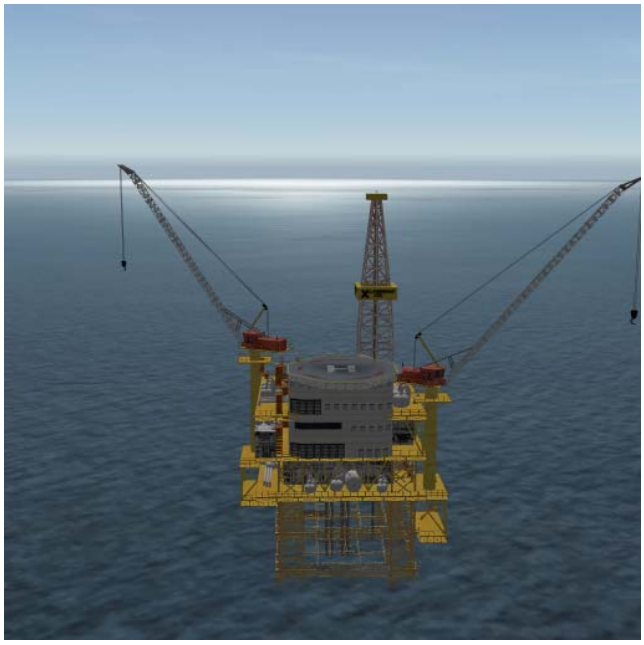
entrol standard visual

6.2 Oil Rigs & Platforms

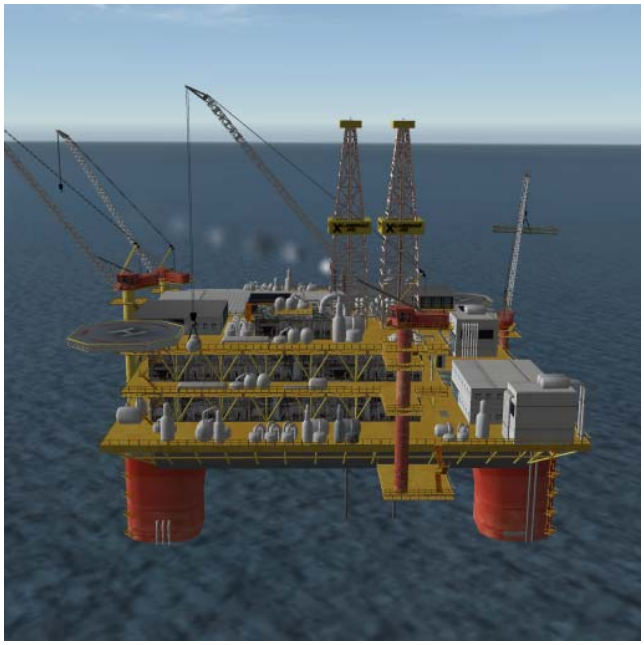
To provide offshore training, our visual system has a simulated oil rig and an oil platform, both with an incorporated helipad.

5 additional Oil Rigs & Platforms can be defined by the client. The oil rigs and platforms can be placed anywhere in the world and can be orientated with the heading required by the client according to the desired approach procedures.

OIL RIG




OIL PLATFORM




6.2.1 List of oil rigs and platforms

- ODPF Oostdijck Platform. 12NM north of EBOS (North Belgium)
- OEUR Europlatform. 50NM East of EHRD (West Netherlands)
- OGOE Goeree Platform. 30NM East of EHRD (West Netherlands)
- OWES West Sole A Platform. 50NM North of EGSH (East England)
- OKIN Kinsale A Platform. 25NM North of EGFF (West England)
- OWAV Waveney Platform. 30NM North of EGSH (East England)
- OLEM Leman 27AD Platform. 40NM North East of EGSH (East England)
- OIND Inde23A Platform. 75NM North East of EGSH (East England)
- OCEN Centrala Platform. 50NM South east from LRTC (East Romania)
- OGLO Gloria Oil Rig. 50NM South east from LRTC (East Romania)

entrol H11 Offshore Oil Rig Approach

You can watch a **video** of a **offshore approach** performed in the entrol H11 here:

https://www.youtube.com/watch?v=0FUYY7ynqN4

6.3 Ship with helipad

A ship with helipad is included.

6.4 Airports

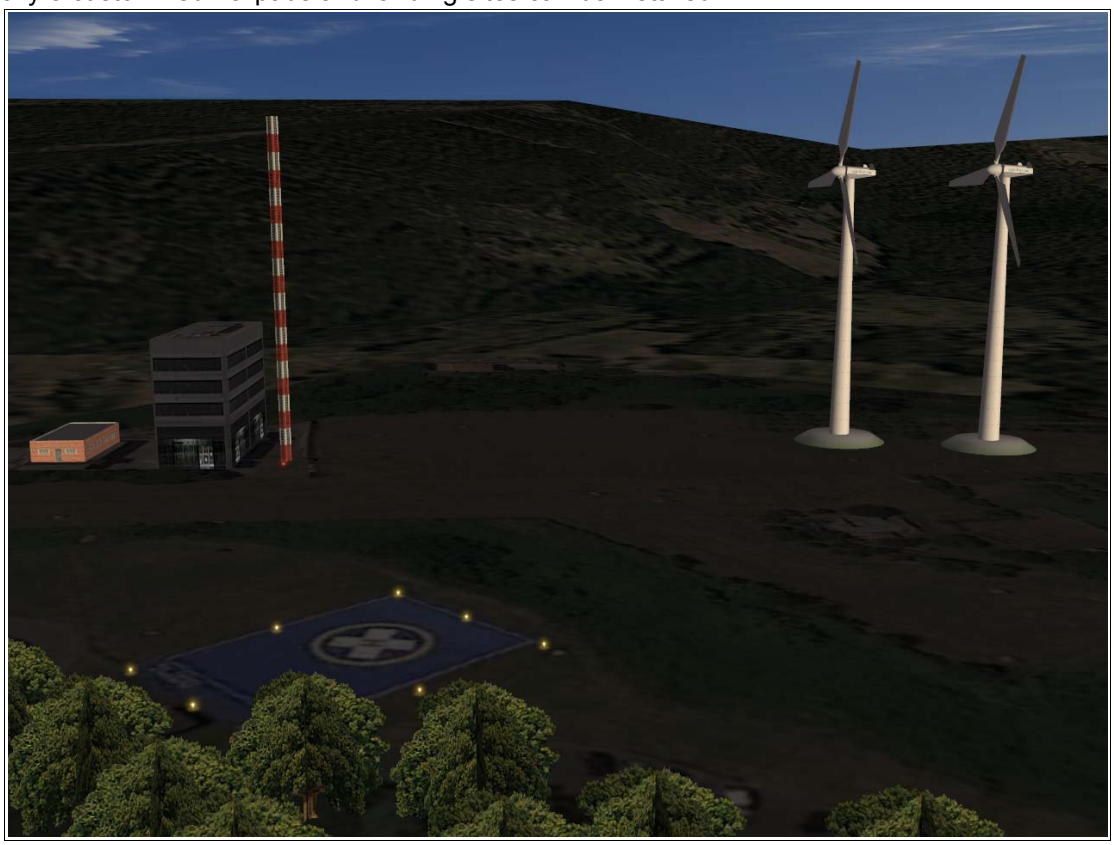
Detailed airports are included.

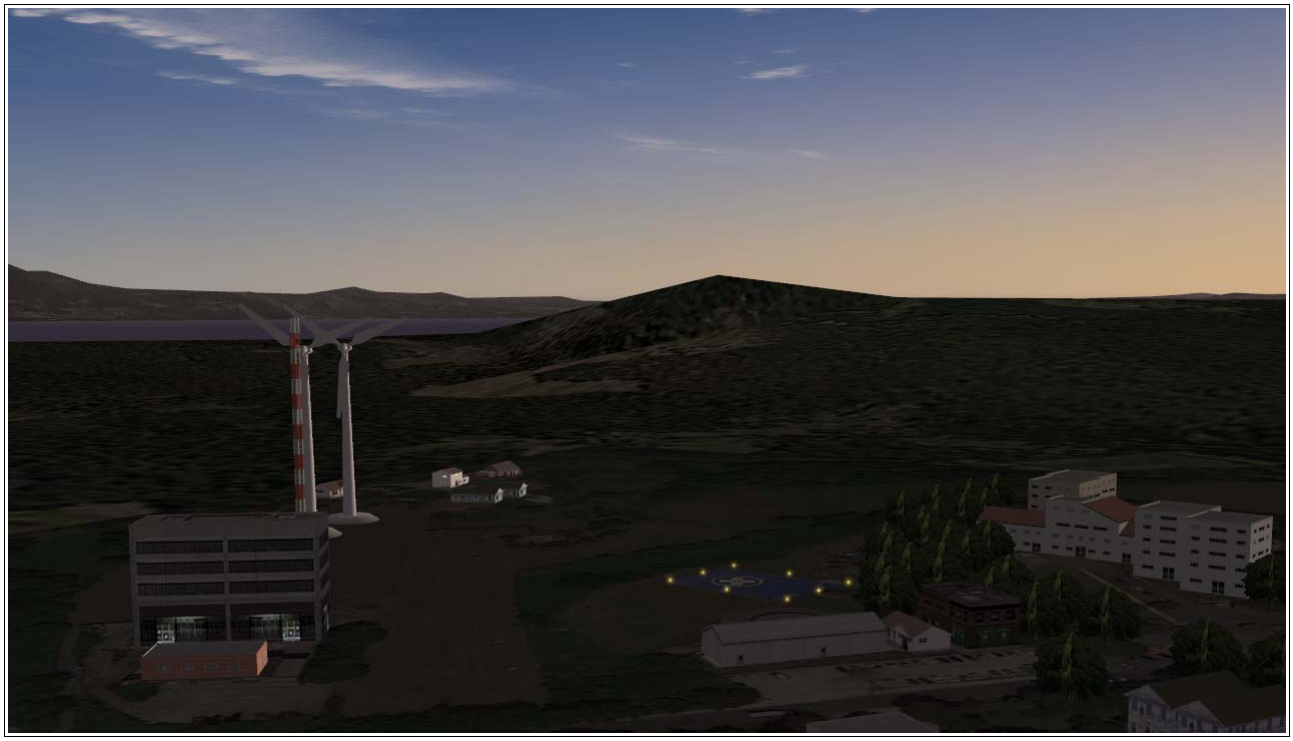
Optionally 3 customized airports requested by the customer can be installed.

6.5 Helipads

Helipads and a specific confined area for take-offs and landings is included.

Optionally 5 customized helipads and landing sites can be installed.



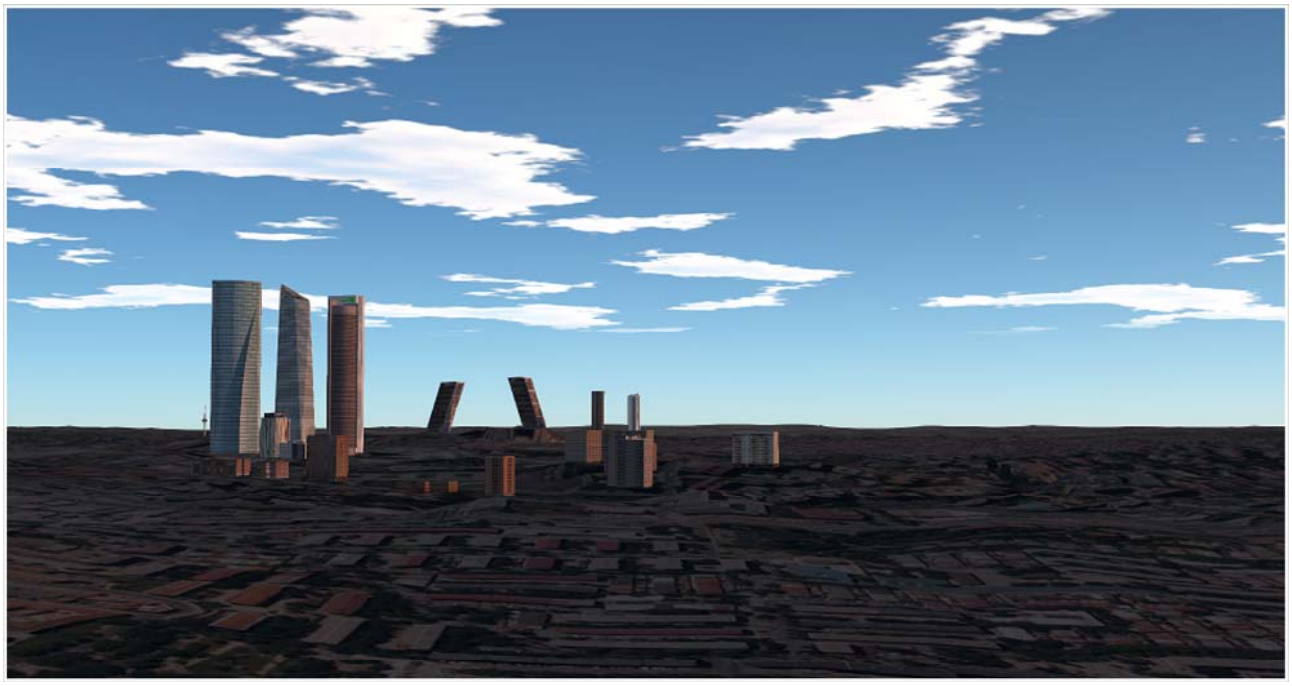


6.6 City Areas

City areas are included.

6.7 *Optional: High Resolution Terrain*

Optionally high resolution terrain can be installed in specific areas requested by the customer.



7 Worldwide database with SID/STAR approaches

Worldwide navigational database with 28-day AIRAC cycle including SID/STARs according to CS-FSTD H is included. It has navigation aids, ILS, VOR, NDB, waypoints and airports.

Geographical features are easily recognizable such as mountains, coastlines and urban areas.

The terrain database will contain defined airfields released in Estonian AIP and cover their normal and geographical specifications.

7.1 entrol Standard Airport/Heliport Navigation Database

Furthemore the entrol Standard Airport & Navigation database will be installed. It covers the navigation aids, en route waypoints and airports of most of Europe. The database is shared among all entrol customers as well as the updates.

The airports confirmed in our navigation database are listed below:

7.1.1 Belgium

- EBAW - Antwerp International Airport
- EBBR - Brussels Airport
- EBCI - Brussels South - Charleroi Airport
- EBKT - Kortrijk-Wevelgem International Airport
- EBLG - Liège Airport
- EBOS - Ostend Airport

7.1.2 Luxemburg

- ELLX - Findel Airport

7.1.3 Denmark

- EKEB - Esbjerg Airport

7.1.4 France

- LFAC - Calais - Dunkerque Airport
- LFAT - Le Touquet - Côte d'Opale Airport
- LFPG - Paris-Charles de Gaulle Airport
- LFQQ - Lille Airport[

7.1.5 Germany

- EDDB - Berlin-Schönefeld Airport
- EDDC - Dresden Airport
- EDDH - Hamburg Airport
- EDDP - Leipzig/Halle Airport
- EDOP - Parchim Airport

7.1.6 Italy

- LIMG - Albenga Airport
- LIEA - Alghero Airport
- LIPY - Ancona-Falconara Airport
- LIMW - Aosta Airport
- LIBD - Bari "Karol Wojtyła" Airport
- LIME - Bergamo-Orio al Serio Airport
- LIPE - Bologna Airport
- LIPB - Bolzano Airport
- LIPO - Brescia Airport
- LIBR - Casale Airport
- LIEE - Cagliari-Elmas Airport
- LICC - Catania-Vincenzo Bellini Airport
- LIBC - Aeroporto di Santa Anna-Crotone
- LIMZ - Turin-Cuneo Levaldigi Airport
- LIRQ - Aeroporto di Firenze
- LIBF - Foggia "Gino Lisa" Airport
- LIPK - Forlì "Luigi Ridolfi" Airport
- LIMJ - Genoa "Cristoforo Colombo" Airport
- LIRS - Grosseto Airport
- LICA - Lamezia Terme Airport
- LICD - Lampedusa Airport
- LIRJ - Marina di Campo "Teseo Tesei" Airport
- LIML - Milan-Linate "Enrico Forlanini" Airport
- LIMC - Milan-Malpensa Airport
- LIRN - Naples-Capodichino "Ugo Niutta" Airport
- LIEO - Olbia - Costa Smeralda Airport
- LIPU - Padua "Gino Allegri" Airport
- LICJ - Palermo-Punta Raisi "Falcone & Borsellino" Airport
- LICG - Pantelleria Airport
- LIMP - Parma "Giuseppe Verdi" Airport
- LIRZ - Perugia-Sant'Egidio "Adamo Giuglietti" Airport
- LIBP - Abruzzo Airport
- LIRP - Pisa-San Giusto "Galileo Galilei" Airport
- LICR - Reggio Calabria "Tito Minniti" Airport
- LIDE - Reggio Emilia "Ferdinando Bonazzi" Airport
- LIPR - Rimini-Miramare "Federico Fellini" Airport
- LIRA - Rome Ciampino "Giovan Battista Pastine" Airport
- LIRF - Rome-Fiumicino "Leonardo da Vinci" Airport
- LIRI - Salerno Costa d'Amalfi Airport
- LIQS - Siena-Ampugnano Airport
- LIBG - Taranto-Grottaglie "Marcello Arlotta" Airport
- LIMF - Turin-Caselle "Sandro Pertini" Airport
- LIET - Tortolì-Arbatax Airport
- LICT - Trapani-Birgi "Vincenzo Florio" Airport
- LIPH - Treviso-Sant'Angelo "Antonio Canova" Airport
- LIPQ - Friuli-Venezia Giulia "Pietro Savorgnan di Brazzà" Airport
- LIPZ - Venice Marco Polo Airport
- LIPX - Verona-Villafranca "Valerio Catullo" Airport

7.1.7 Netherland

- EHAM - Amsterdam Airport Schiphol
- EHRD - Rotterdam The Hague Airport

7.1.8 Norway

- ENBR - Bergen Airport, Flesland
- ENZV - Stavanger Airport, Sola

7.1.9 Spain

- LEVS - Cuatro Vientos Airport
- LEAL - Alicante Airport
- LEBL - El Prat / Barcelona Airport
- LEBB - Bilbao Airport
- LEBG - Burgos Airport
- LERL - Ciudad Real Central Airport
- LECO - A Coruña Airport
- LEGT - Getafe Air Base
- LEHC - Huesca-Pirineos Airport
- LEJR - Jerez Airport
- LEMD - Madrid Barajas International Airport
- LEPA - Palma de Mallorca AirportLERS - Reus Airport
- LELL - Sabadell Airport
- LESB - Son Bonet Airport
- LEVC - Valencia Airport
- LEZG - Zaragoza Airport
- LEMG - Malaga Airport
- GCFV - Fuerteventura - El Matorral Airport
- LEPP - Pamplona-Nóain Airport
- LEDA - Lleida-Alguaire Airport

Heliports

- GECE - Ceuta Heliport
- LEUL - Ullastrell-Teresa Vilá Heliport

7.1.10 Turkey

- LTAF - Adana Şakirpaşa Airport
- LTAT - Malatya Erhaç Airport
- LTBY - Anadolu Airport
- LTCA - Elazığ Airport
- LTCE - Erzurum Airport
- LTAJ - Gaziantep Oğuzeli Airport
- LTAI - Antalya Airport
- LTAC - Ankara - Esenboğa International Airport
- LTBJ - Izmir - Adnan Menderes International Airport
- LTFE - Milas-Bodrum Airport
- LTBS - Dalaman Airport
- LTAZ - Nevşehir Kapadokya Airport
- LTCS - Sanliurfa Gap International Airport
- LTBU - Tekirdağ Çorlu Airport
- LTCG - Trabzon Airport
- LTAH - Afyon Airport

- LTBA - Istanbul - Atatürk International Airport
- LTCN - Kahramanmaraş Airport
- LTFJ - Istanbul - Sabiha Gökçen International Airport
- LTFC - Isparta Süleyman Demirel Airport
- LTHA -
- LTHB -
- LTCM - Sinop Airport
- LTAS - Zonguldak Airport
- LTDA - Hatay Airport
- LTBH - Çanakkale Airport

7.1.11 UK

- EGLL - London Heathrow Airport
- EGNJ - Humberside Airport
- EGPD - Aberdeen Airport
- EGSC - Cambridge Airport
- EGSH - Norwich International Airport

7.1.12 Romania

- LROP - Bucharest "Henri Coandă" International Airport
- LRBS - Bucharest Baneasa / "Aurel Vlaicu" International Airport
- LRTR - Timişoara "Traian Vuia" International Airport
- LRBC - Bacău International Airport
- LRSB - Sibiu International Airport
- LRPW - Ploiesti Airport

Heliports

- LRPH - PLOIESTI / Aero Taxi
- LRBG - BRASOV / Ghimbav
- LRCX - BRASOV / Cobrex

7.1.13 Malta

- LMML/LUQA - Malta International Airport

7.1.14 Chile

- SCTE - Puerto Montt / El Tepual Airport
- SCIE - Concepción / Carriel Sur International Airport
- SCFA - Antofagasta / Cerro Moreno International AirportAirport
- SCCI - Punta Arenas / Presidente Carlos Ibáñez del Campo International Airport
- SCAR - Arica / Chacalluta International Airport
- SCIP - Isla de Pascua / Mataveri International Airport
- SCDA - Iquique / Diego Aracena International Airport
- SCEL - Santiago / Comodoro Arturo Merino Benítez International Airport

7.2 entrol Standard SID / STAR approaches Database

Airport standard approaches, SID's and STAR's are included for the following airports.

Additionally customized SID's / STAR's and approaches requested by the customer can be added to FMS (at a cost)

7.2.1 Belgium

- EBBR - Brussels Zaventem Airport
- EBCI - Brussels Charleroi Airport
- EBOS - Ostend Airport

7.2.2 Germany

- EDDB - Berlin Schonefeld Airport
- EDDC - Dresden Airport
- EDDP - Leipzig/Halle Airport
- EDOP - Schwerin Airport

7.2.3 Netherlands

- EHAM - Amsterdam Schiphol Airport

7.2.4 Turkey

- LTAC - Ankara/Esenboga Airport
- LTAI - Antalya Airport
- LTAZ - Nevsehir Airport
- LTBA - Istanbul Ataturk International Airport
- LTBY - Andolu Airport

7.2.5 Chile

- SCTE - El Tepual
- SCIE - Concepción
- SCFA - Cerro Moreno
- SCCI - Punta Arenas
- SCIP - Mataveri Isla de Pascua

- SCDA - Diego Aracena - Iquique
- SCEL - Pudahuel

7.2.6 UK

- EGLL London Heathrow

7.2.7 Spain

- LEAL - Alicante Aiport
- LEBB - Bilbao Airport
- LEBL - Barcelona/El Prat Airport
- LEGE - Girona Airport
- LEMD - Madrid/Barajas Airport
- LEPA - Palma de Mallorca Airport
- LERS - Reus Airport
- LEVC - Valencia Airport

7.2.8 Romania

- LRTR - Timisoara
- LRCV - Craiova General
- LRTC- Tulcea
- LRBS - Bucharest Baneasa

8 Enclosed instructor station with two 24” tactile screens

The IOS is designed around two 24” tactile screens and an intuitive software that does not require mouse or keyboard during exercises to control.

Enclosed instructor station with two 24” tactile screens

8.1 IOS Main Characteristics

- Two 24" tactile screens with an intuitive and easy interface
- Automatic QTG's on the Instructor Station can be printed and saved
- Failures organized by systems easily activated
- Weight and balance, fuel quantity, ZFW,..
- Atmospheric and visual conditions can be changed in real time
- Lateral and vertical approach view
- Approach Plates of the defined airports with the position of the aircraft over the page can be displayed

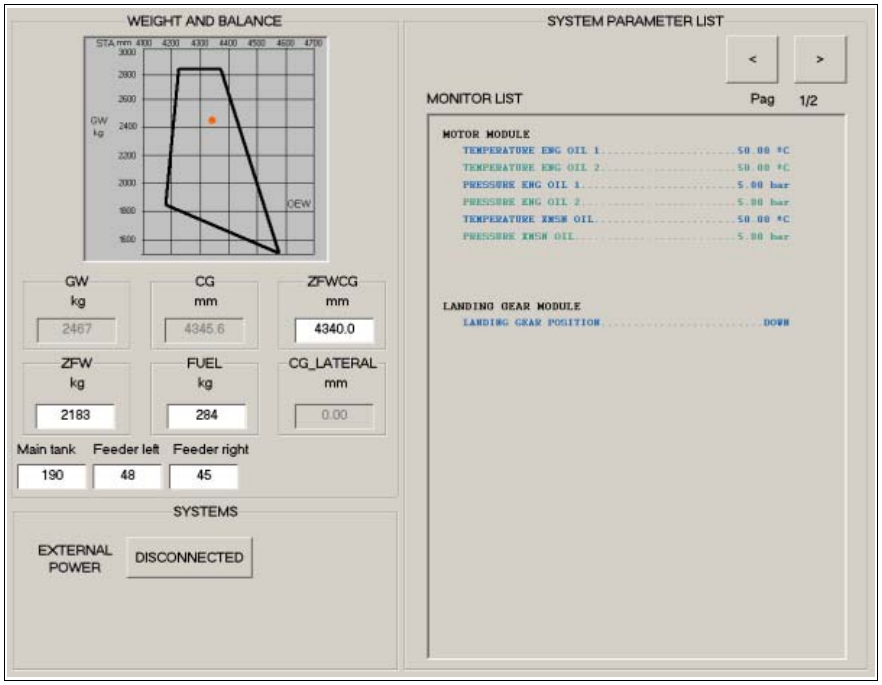
Two 24" tactile screens with an intuitive and easy interface

8.2 IOS Display

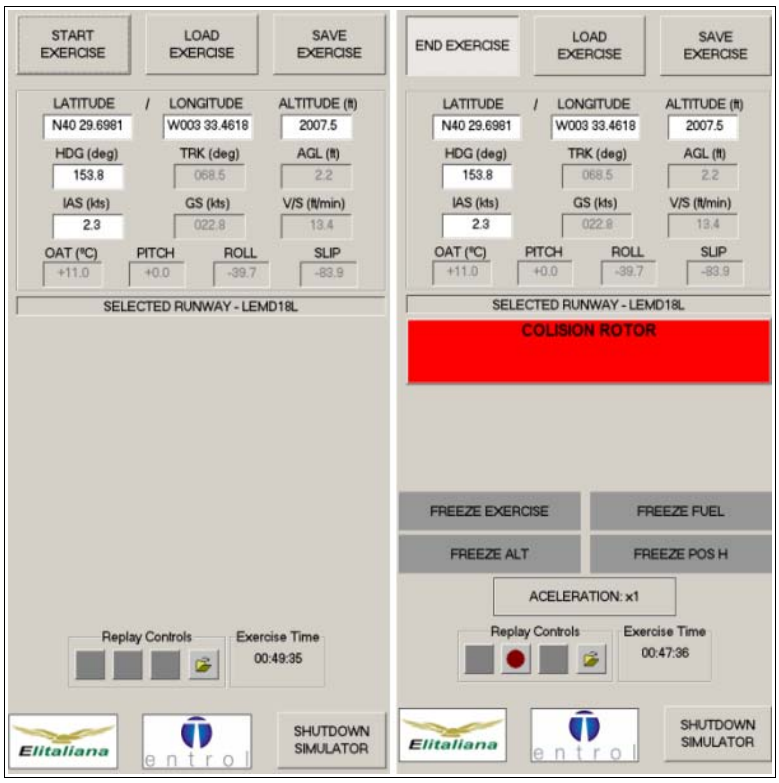
The main IOS display has the following three main areas:

1. One upper bar, always visible, with push-buttons for selecting the active page. In the left end it has the flight freeze/unfreeze control

2. An area to show the different pages selected on the upper bar:
    1. Map Page
    2. Approach Map Page
    3. Atmospheric and visual condition page
    4. Failures Activation page
    5. Position Page
    6. Weight and systems page
    7. Entities Page
    8. Status Page
    9. Controls Page



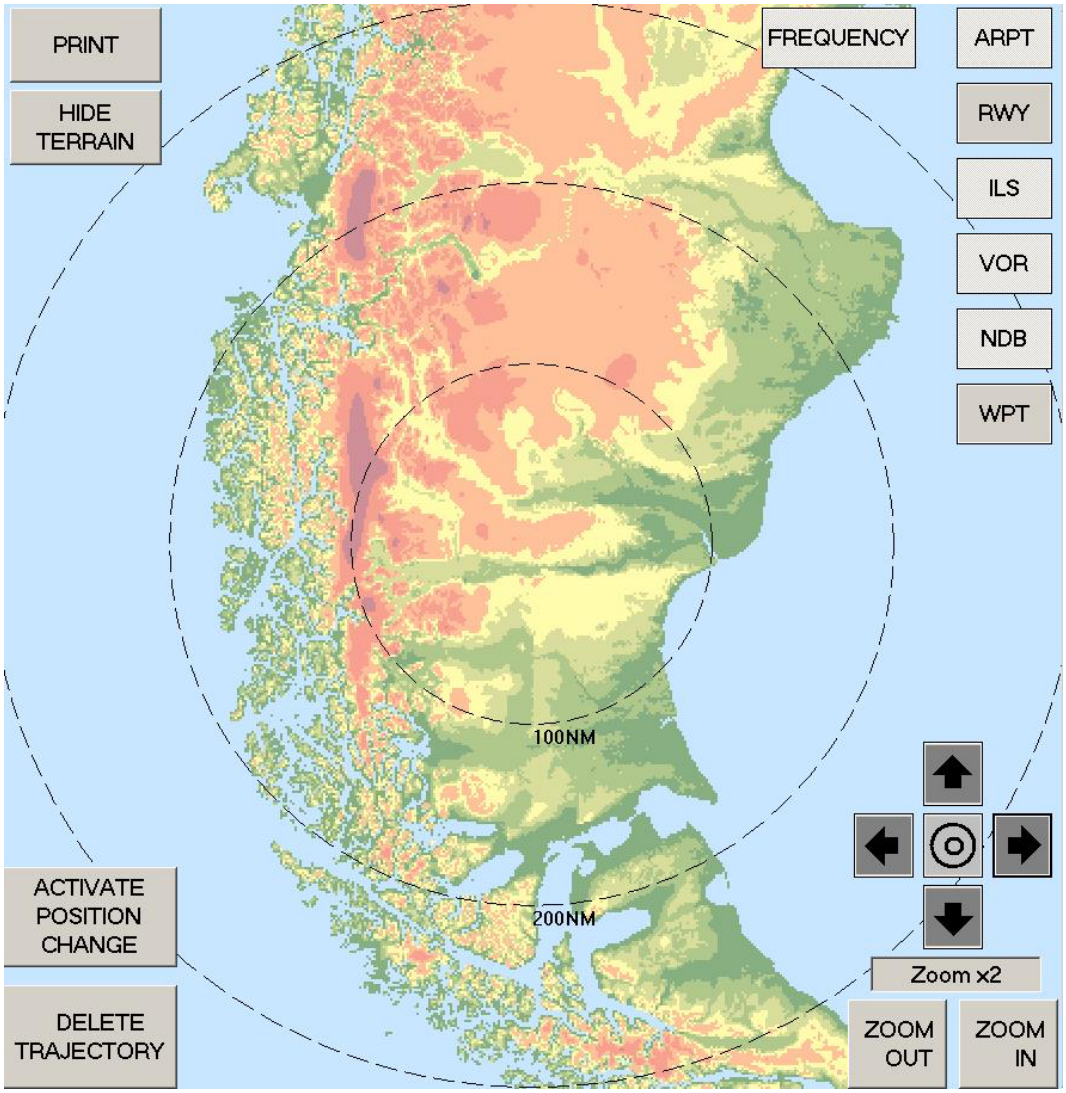
3. On the right side, an area with controls for the most important flight and exercise parameters:



8.3 IOS Pages

8.3.1 Map Page

It appears by pressing on the Map button on the upper selection menu. This page presents a geographic schematic map, trajectory of the aircraft, navaid and runway indications.



Map Page

This page can be moved, zoomed, and center on the aircraft's actual position. It has a concentric scale range in Nm for a quick estimation of distances. It also allows a quick reposition of the aircraft in case of a 'crash' or any other eventuality. The reposition is just horizontal, maintaining the rest of the parameters as they were in the moment of the reposition.

Runway data, airports, navaids and waypoints can be deactivated by category to 'clean' the excess of information on the screen, by pressing the corresponding button on the right side of the screen.

It can present a normal flat presentation or a Terrain presentation (limited to zoomx2).

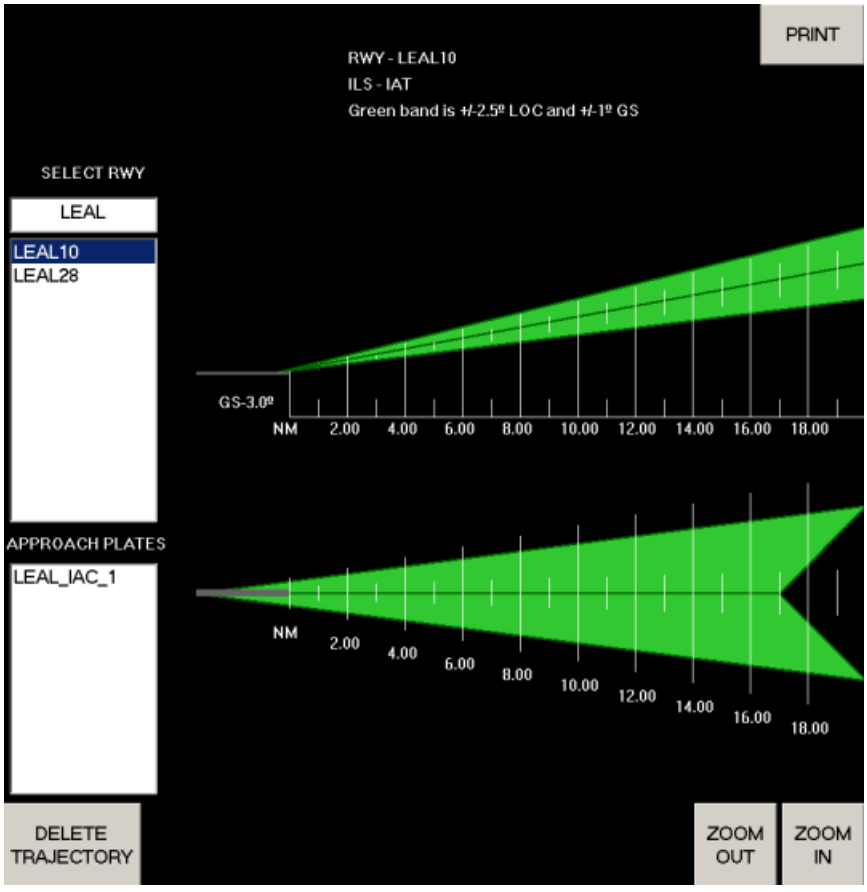
8.3.2 Approach Map Page

It appears by pressing the App Map control on the upper menu selector.

If a runway has been selected on the runway selection list you visualize an approach guide to the runway both lateral and vertical.

The lateral guide corresponds to the axis of the runway with a beam width of +/- 2.5º. The vertical guide corresponds with the glideslope angle (if the runway has an ILS, if not it puts a default angle of 3º) with a beam of +/- 1º.

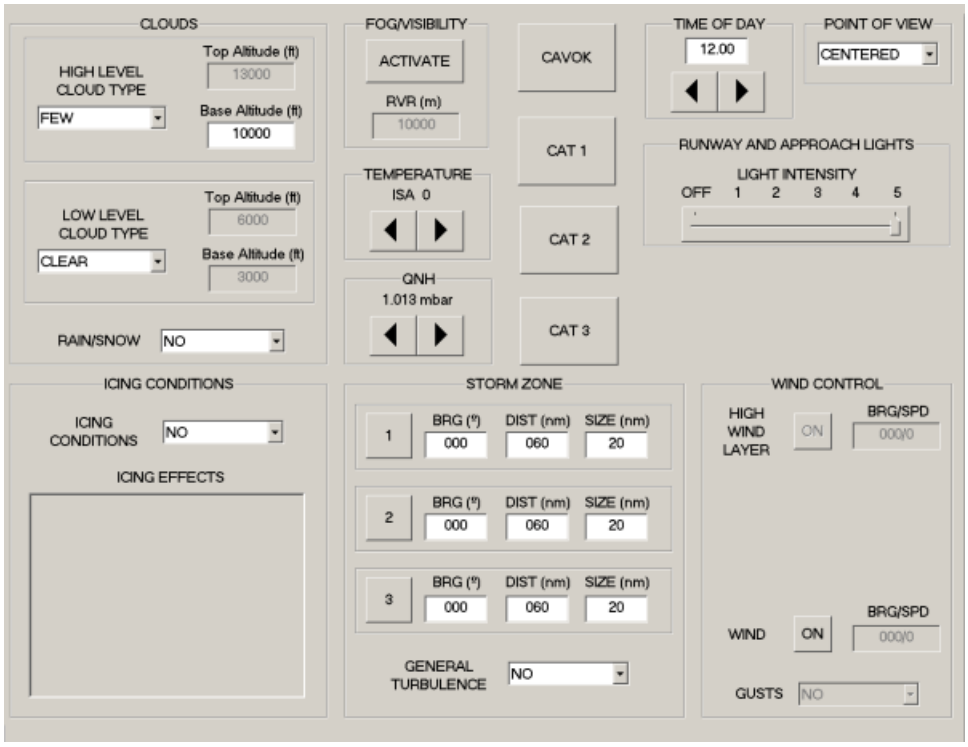
The actual position and trajectory of the aircraft is drawn over these guides. If the ILS has markers they will appear over the guides with a blue O, for an outer marker; a yellow M, for a middle marker; and a white I for an inner marker.



Approach Map Page

8.3.3 Atmospheric and Visual Condition Page

It appears by pressing Visual control on the upper selection menu. The controls for atmospheric and visual conditions appear on this page.

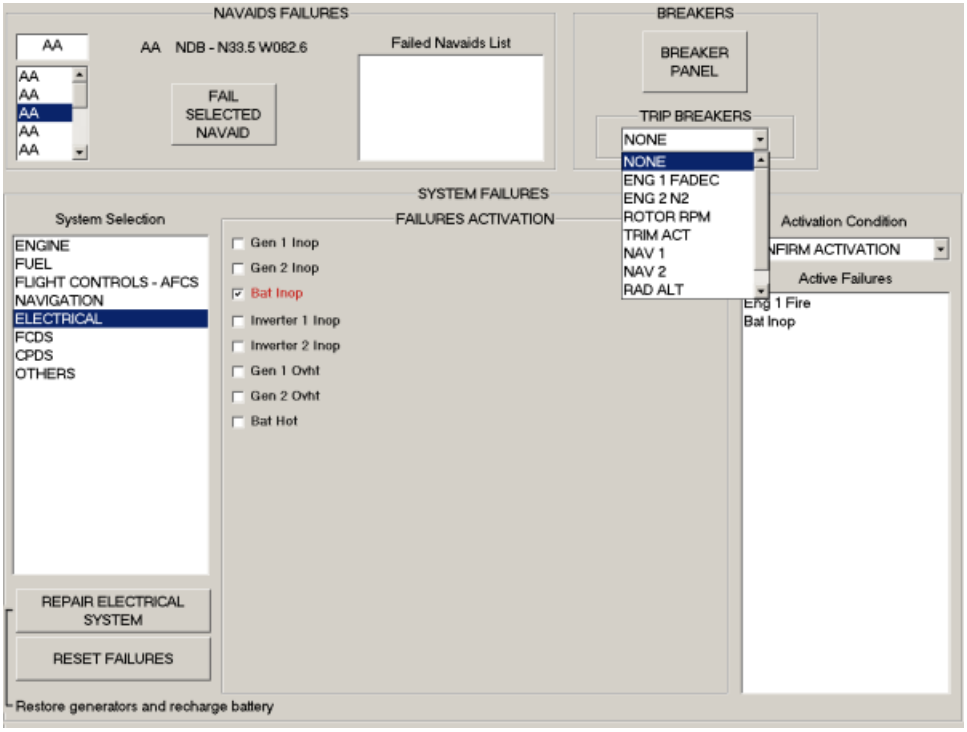


Visual Page IOS

8.3.4 Failures Activation Page

It appears by pressing the Failures control on the upper selection menu. This page presents the controls for the activation and deactivation of failures in the aircraft's systems.

Failures Page



Failures Page IOS

The procedure to activate a failure is the following:

- Select the system on the 'System Selection' list, and a checkbox list with all the possible failures of the system will appear on the 'Failures Activation' window.
- Checking on any of the checkboxes, the correspondent failure will be activated and will pass to the 'Active Failures' list if the 'Activation Condition' listbox is set to 'Direct Activation'. In other case it will proceed according to the activation condition selected.

The activation condition has four possible values:

- **Confirm Activation:** a dialog box will pop up and ask if you really want to activate the selected failure.
- **Direct Activation:** the failure will be active after checking the correspondent checkbox.
- **Ias Activation:** a keyboard will appear asking for the ias activation value. The fail will be activated when the aircraft reaches the selected value.
- **Altitude Activation:** idem as ias activation.

To deactivate a failure, unchecked it. The failure will be removed from the 'Active Failures' window.

When the name of a failure is black, the failure is not active. When it turns red, the failure is active. When an Ias or altitude activation condition is selected, the failure is orange until the condition is reached, then it turns red and the failure is active.

To recover a complete system the button 'Repair – System' should be pressed. Linked to this button, at the bottom of the page, appears a message with the parameters that will be restored by pressing this button.

Also all the failures activated could be reset by pressing the button “Reset failures'.

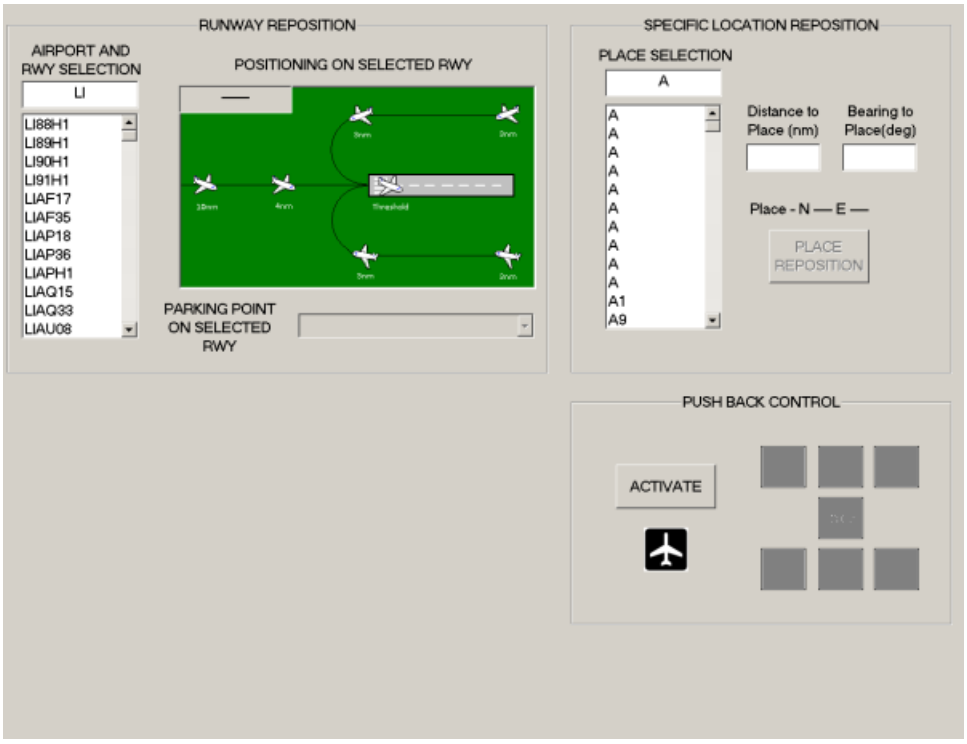
Individual navaids failures can be selected.

- Enter the navaid Ident in the upper edit box. A list of navaids that begins with the Ident inserted appear in the list below.
- Select one of the listed navaids. Its type and coordinates are presented, and also the FAIL SELECTED NAVAID pushbutton is enabled.
- Pushing the button transfer the selected navaid to the failed navaids list.
- To recover a failed navaid click on it on the failed navaid list.

The breaker panel button opens a new window with all the system breakers that are simulated. Under this button is a listbox with the breakers that can be tripped in the simulator hardware.

8.3.5 Position Page

It appears by pressing the Position control on the upper selection menu. This page presents the controls for reposition and runway selection.



Position Page IOS

Once the reference airport and runway is selected you can press on one of the aircraft icons to position in one of the following conditions:

a. Ground – On Runway Threshold

b. Approach – 4NM

c. Approach - 10NM

d. Circling – Runway Threshold on the right

e. Circling – Runway Threshold on the left

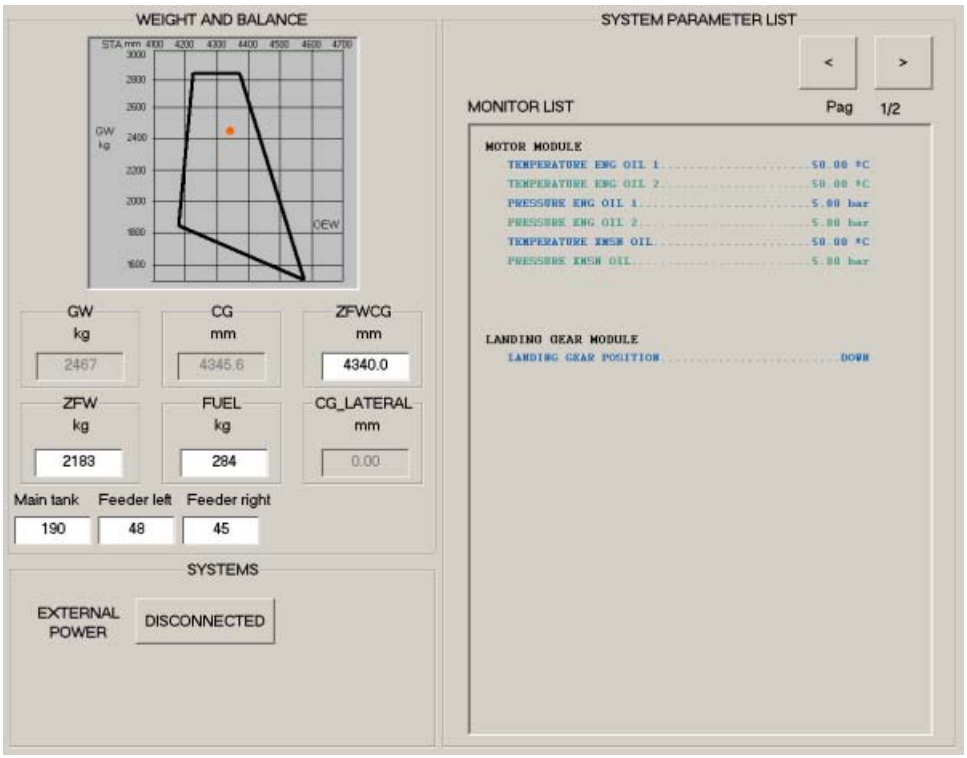
f. Circling – Runway on the right

g. Circling – Runway on the left

Instead of one of this positions, it is possible to position the aircraft in a parking point, if it is available for the airport selected. You can also select a navaid or fixed to position in reference to it (BRG and distance).

8.3.6 Weight and Systems Page

It appears by pressing the Weight&Sys control on the upper selection menu. This page shows the control for the weight and balance of the aircraft, the fuel conditions and the controls of some systems. It also presents an area to show messages with additional information about the state of the aircraft conditions.



Weight and Systems Page IOS

On the weight and balance area is a graphic with the maximum limits of longitudinal balance of the aircraft in function of its total weight.

8.3.7 Entities Page

It appears by pressing the Entities control on the upper selection menu. This window allows to define and control the position and characteristics of intruders that will appear on the simulation. It also allows to control some crew and radio communications.

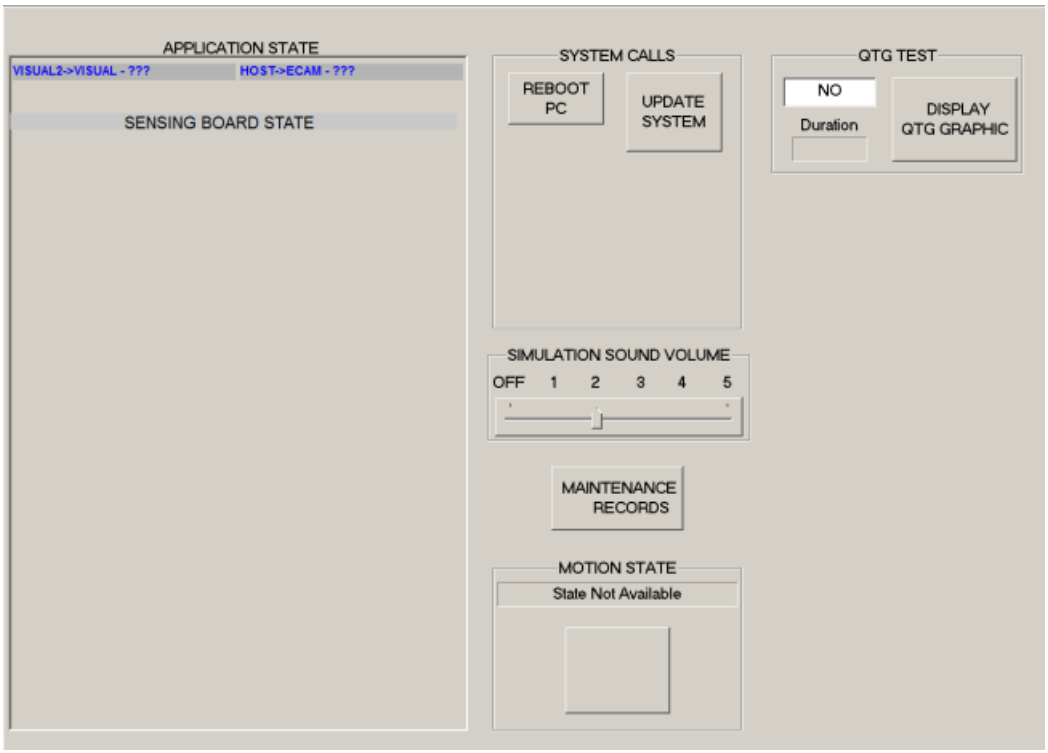
Entities Page IOS

To activate an intruder first it should be selected the type of intruder and then the situation where the intruder will appear.

When the intruder is active, it will be possible to change parameters as distance, ias, hdg and vertical speed.

8.3.8 Status Page

It appears by pressing on the Trainer control on the upper selection menu. This page reports of the trainer's terminals status. In this page is the certification tests management menu, and the management of the initial conditions to perform the exercises.



Trainer IOS Page

8.3.9 Controls Page

Figure 8.1: Upper Menu Bar: Controls Page

It is prepared for maintenance personnel use. It appears by pressing Controls control on the upper selection menu. To access you need to have the User ID and password.

9 Sound System

The simulator has a **8 lines in/out Matricial Mixer** to properly simulate all communications in the cockpit:

- The simulator will have 3 helicopter standard jacks for connecting pilot, copilot and instructor headsets located in proper places
- The Instructor can configure IOS to simulate communication on COM 1 or COM 2 channel depending on pilot audio selection on audio control panel, or activate hot function allowing communication with all stations independent from pilot audio selection.

Cockpit significant sounds will change according to configuration:

- Rotor volume and frequency depending on rotor speed
- Turbine volume and frequency according to turbine speed
- Wind aerodynamic sound
- Representative alert sounds

Aural and environmental sounds represented on the simulator are the following:

- Stall warning
- AP disconnect
- Master warning and master caution
- Radio altimeter callouts
- Engine sound
- Wind sound
- Touchdown sound
- Crash sound

10 Simulated Failures

The simulated failures are the following. Please notice that the symbol “# “indicates 1 or 2:

Engine Failures	Fuel Failures
ENG # FAILURE	FUEL PUMP XFER FWD INOP
ENG # FIRE	FUEL PUMP XFER AFT INOP
ENG # HI TOT	FUEL FILTER # FAIL
FADEC # FAIL	
IGNITION FAILURE – HUNG START	**Flight Control System Failures**
LOW POWER ENG #	AFCS INOP - AP DISCONNECT AND INOPERATIVE
OIL ENG # CHIPS	AFCS TRIM INOP
OIL ENG # LOW PRESS	PITCH SEMA INOP
OIL ENG # HI TEMP	ROLL SEMA INOP
ENG # AXIS FAIL	YAW SEMA 1 INOP
ENG # GOV FAIL - NO FADEC CONTROL	YAW SEMA 2 INOP
OIL XMSN CHIPS	PRSAS INOP
OIL XMSN LOW PRESS #	YAWSAS INOP
TAIL ROTOR CHIPS	COLL POS SENSOR INOP
	LOSS CONTROL TAIL ROTOR
Navigation Failures	LOCKED TAIL ROTOR
VOR RECEIVER FAILURE (VOR 1 OR VOR 2)	
LOC RECEIVER FAILURE (LOC 1 OR LOC 2)	
GS RECEIVER FAILURE (GS1 OR GS2)	
ADF RECEIVER FAILURE	
RADAR ALTIMETER FAILURE	
STANDBY HORIZON FAILURE	
COMPASS FAILURE	

Electrical Failures	FCDS failures
GENERATOR # FAILURE	FCDS CHECKCONF#
BATTERY DEPLETED	FCDS MISMATCH#
EXCESSIVE ELECTRICAL LOAD	FCDS PINPROG#
BATTERY HOT	FCDM # FAILURE
INVERTER # FAILURE	AHRS # FAILURE
GEN # OVHT	ADC # FAILURE
	ICP # FAILURE
VEMD & CAD Failures	PFD # FAILURE
VEMD SUP FAILURE	ND # FAILURE
VEMD INF FAILURE	
CAD FAILURE	**Other systems Failures**
TRQ SENSOR # FAILURE	HYD SYS # FAILURE
TOT SENSOR # FAILURE	HTG OVTEMP
N1 SENSOR # FAILURE	ICE DET FAILURE

11 FNPT II MCC Certification

Entrol will provide on-site assistance to the initial certification with the Estonian CAA in the Estonian Aviation Academy.

The simulator is delivered with a "**Qualification Test Guide (QTG)"** which contains all the information from a technical point of view required for the certification of the device according to EASA regulations.

First version of MQTG document with flight data will be delivered with FAT. Technical adjustments and configuration changes during MQTG development until all objective test results are in tolerance and subjective requirements are satisfied will be done.
The QTG contains a list of test reports which describe the simulator's behavior in detail and allow comparison of the simulator's characteristics with actual aircraft data. The Instructor Station has an option to run automatically all the tests required for the certification of the simulator.

entrol provides a "**Flight Manual**" where all the systems and emergency procedures of the simulator are defined and explained, as well as a "**Maintenance Manua**l" to perform all the required maintenance actions on the simulator.

entrol gives an "**Installation Requirements Document**" where it specifies the requirements that the room needs to meet in order to certify the whole installation under the EASA.

The QTG are run automatically and saved in pdf format. Results are kept in the simulator and entrol as backup.

11.1 Specific measurement equipment for certification

During the Initial and recurrent certification of the simulator the following elements are required:

- Dynamometer
- Spot Photometer
- Sound Recorder

entrol owns these elements and can take them to the initial and recurrent certification if hired. Confirm in advance the dates of certification to confirm the availability of the equipment.

entrol strongly recommends contacting the local authorities to check any additional requirements that might apply.

Some national authorities require that the operator owns this type of measurement equipment to be able to perform the tests at any moment during maintenance. National authorities might also request that the measurement equipment is calibrated every year.

Contact entrol in case you want additional information for the type of measurement equipment to purchase.

11.2 Italian CAA Certificate

REPUBBLICA ITALIANA

ENAC
ENTE NAZIONALE PER L'AVIAZIONE CIVILE

CERTIFICATO DI QUALIFICAZIONE FSTD

F S T D QUALIFICATION CERTIFICATE

Nr. **IT-060**

L'ENAC,
Autorità competente della Repubblica Italiana, Membro della Unione Europea, certifica che

On behalf of the ENAC, competent Authority of the Italian Republic Member of European Union, it is hereby certified that

FSTD: **FNPT Type II MCC**
type: **Generic multi-engine Helicopter (EC-135P2+)**,
manufactured by: **ENTROL**, s/n: **H11-003**

operato da/*operated by*

Cavallino Rampante Srl

e ubicato presso/*located at*

Via Ripe di Bagnara, 4 - 48022,
Lugo di Ravenna Airport (LIDG)

risponde ai requisiti di Qualificazione prescritti nelle norme **JAR-FSTD H** secondo le condizioni della Specifica di Qualificazione allegata.

*has satisfied the Qualification Requirements prescribed in **JAR-FSTD H** and subject to the conditions of the attached FSTD Specification.*

Questo certificato non è trasferibile, e a meno di sospensione o revoca, rimane valido fino al **31/01/2012**

*This Certificate is not transferable and unless sooner suspended or revoked, shall continue in effect until **2012, 31 January***

Edizione n. **1**
Issue

Date **05/01/2011**

BOLLO ASSOLTO IN MODO VIRTUALE AUT. DIREZ. REG. ENTRATE LAZIO N. 135047/98 del 30/11/98

Il Direttore Regolazione Navigabilità & Operazioni
Head of Airworthiness & Operations Regulation
Ing. Marco Silanos

CI/SP Form 130 – FSTD

Ente Nazionale per l'Aviazione Civile	FSTD SPECIFICATION	Pag. 1 / 1 Rev. 0 Data: 05/01/2011

Certificato FSTD N. **IT-060**

FSTD Certificate No.

A) **Tipo di Aeromobile**
Type/Variant of Aircraft
Generic multi-engine Helicopter (EC-135P2+)

- Data in servizio/Date in service: November 2010

B) **Livello di Qualificazione**
FSTD Qualification Level
FNPT Type II MCC

C) **Sistema di visualizzazione**
Visual System
Three LCD Projectors Sanyo PLC-ET30L - not collimated FoV: V 40 deg - H 150 deg

D) **Sistema di movimento**
Motion System
N/A

E) **Motorizzazione**
Engine fit
Two P&W 206B2 w/ FADEC

F) **Strumentazione**
Instrument fit
EFIS (PFD/ND) / 1 three axys AFCS with Mode annunciator / 1 F/D with SAS / 1 ADF / 2 VHF-NAV / 2 DME / 2 VHF-COM / 1 Marker / 1 Trasponder / 1 Radar (WX & ARA) / 1 FMS UNS-1D with GPS

G) **Impianto TCAS**
TCAS fit
N/A

H) **Raffica discendente**
Windshear detection
N/A

I) **Minimi operativi**
AWO capability
Approach down to CAT 1 (200 ft DA (QFE) / 500 m RVR)

J) **Idoneità addizionali**
Additional capabilities
- Qualification Airfields: LIPK, LIPR, LIPY, LIRA, LIBP - available additional equipments: 1) emergency floats 2) searchlight 3) air conditioning 4) anti ice detection 5) FMS
- customized airport scenes: LEVS, EBOS - Oil rig (N 51.16.6 E 002.26.9).

K) **Restrictions/Limitazioni**
Restrictions/Limitations
1) FMS: SIDs/STARs are not available within the Qualification airports
2) IFR checks (revalidation and renewals only) may be carried out for the EC-135P2+ type rated pilots only

Il Direttore Regolazione Navigabilità & Operazioni
Head of Airworthiness & Operations Regulation
Ing. Marco Silanos

CI/SP
Form 130 – FSTD specification

12 Maintenance technicians and instructors training

Before shipment of the simulator, entrol will provide training to the technicians in Madrid and instructors in Estonian Aviation Academy upon installation.

12.1 Maintenance technicians training

entrol will train TWO (2) technicians to be able to:

- Disassemble the cockpit
- Change the configuration of the cockpit
- Perform periodic maintenance on the simulator
- Check training records and solve daily minor incidences
- Evaluate failures & perform updates and additional checks
- Be the contact person with entrol

This Maintenance Technician needs to have:

- Medium knowledge of computers and user level of Windows
- Medium knowledge of electronics
- Be able to use tin welder and other hand tools
- Medium level knowledge of English (spoken and written)

The course takes 2 days and is done before shipment of the simulator. So the technician can see all parts and components on the sim being disassembled and crated.

Upon finishing the course the technician will be certified by entrol to perform the normal and periodic maintenance on the simulator. The technician will understand the simulator and how it works. He will be able to replace the different parts and do the required quarterly maintenance.

12.2 Instructors Training

entrol will train TWO (2) appointed instructors on the use of the simulator and common practices such as:

- Start and stop of the simulator
- Use of all the functions of the instructor station
- Log books and record keeping
- Failure evaluation
- Improvements and required updates analysis, in collaboration with entrol (Head of Training duty only)

13 Simulator Maintenance

13.1 36 Months Warranty

The simulator has a warranty of **36 months** after acceptance for all the parts and components under normal use and service.

We will provide support to repair and replace any parts spent due to the standard use of the simulator. The normal wear due to use is not included under the warranty (i.e. projector lamps).

13.2 Maintenance Service

13.2.1 Scope

The maintenance services includes:
• SW Correction & Update • HW Correction • Quarterly Database Update • Documentation Management Service • Yearly Visit for Recurrent Certification Assistance and Systems Check

SW Correction & Update

- Assist in the isolation, identification and correction of software reproducible malfunctions of the Simulator. These malfunctions prevent the Simulator from substantially performing its activity in accordance with the Technical Specifications described in Entrol´s Offer. These malfunctions must be reported to Entrol by Client.

- Provide patches, bug fixes, minor enhancements or any other modification to the software running within a Simulator, which are not considered an upgrade.

- For the avoidance of doubt, “upgrade” means and not limited to, new airports, SID-STARS and other elements in the navigation database, software releases and/or new software versions with significant enhancements in functionality (including capacity, scalability, flight model changes, QTG modification, etc) and specifically any modification in the SW due to a recurrent certification.

HW Correction

- Assist in the isolation and identification of Hardware components malfunction and provide with relevant information to the Client technician personnel to repair or replace the failed Hardware components.

Quarterly Database Update

- Provide quarterly database update to fulfil the requirements of the relevant version of the CS-FSTD A regulation or the one applicable to the certification of the simulator if other.

Documentation Management Service

- To maintain and update annually the list of Hardware components and Software files of the Simulator.

Yearly Visit for Recurrent Certification Assistance and Systems Check

- To provide a yearly visit of two workdays to customer premises for recurrent certification assistance and systems check. Travel expenses and travel diets are not included and will be billed at entrol applicable rates.

On-site technical assistance, any upgrade or any other service other than specifically above listed will be provided at Client's request. It shall be provided at entrol current maintenance rates and price list.

13.2.2 Contact

entrol will provide a telephone and email to the client. entrol will attend requests that are made through these channels. entrol will provide the service (in Spanish or English language) from Monday to Friday between 09:00 to 17:00, Spanish time (CET). Out of this hours answer by the personnel is not guaranteed.

entrol will answer through these channels any technical question, information request or preliminary analysis, without limitation on the number of requests. That notwithstanding requests will be answered in strict order of arrival and attending to the operational capacity of entrol.

13.2.3 Remote Support

The trainer has a remote control program and a specific router for entrol to access and remote manage the simulator and provide the standard maintenance services.

Client must make available that one of the PC computers has Internet access. To provide this service there has to be a technician on the trainer in order to proceed with the error detection and solution with entrol. This technician must have the capabilities specified on section 11 to assist Entrol during the process.

14 Spare Parts

entrol will provide free of charge with the simulator the following:

- Toolbox with all the tools necessary to perform normal maintenance of the simulator
- Spare part set for normal elements on the simulator:
  - Set of potentiometers
  - Set of encoders
  - Set of Breakers
  - Set of switches
  - Set of linear potentiometers

This elements are considered the basic set for the simulator. The toolbox shall be maintained and checked properly so all maintenance actions are done by the customer.

Any element removed or weared of the toolbox shall be restocked by the customer. entrol shall provide it if necessary for a price.

14.1.1 Optional Spare Parts

entrol defines an optional spare part list of different elements that the operator can have on-site. Spare parts replaced during the warranty period will be restocked free of charge. (Shipping not included)

- Level 1: Long delivery time and they cause system inoperativeness
  - Engines on Flight Controls
  - Digital control board and reverse current protection on flight controls
  - Host/Visual Computer
  - Center Console TFT 1
  - Center Console TFT 2
  - CDU TFT
- Level 2: Short delivery time and they cause system inoperativeness
  - DC Power supply for the electronics, engines and lighting
  - Simulator TCPIP Sensing Boards
    - DI&DO
    - DI/DO Mini

- Analog
- Displays
- Circuit Breakers

14.1.2 Spare Parts Level 1

Qty	Element	Price
1	Engine	820 €
1	Digital Controller and Shunt	890 €
1	Host/Visual Computer preconfigured	2.000 €
1	Center Console TFT 1	500 €
1	Center Console TFT 2	550 €
1	CDU TFT	600 €
	Price Level 1	**5.360 €**

14.1.3 Spare Parts Level 2

Qty	Element	Price
1	5 V Power supply Electronics	65 €
1	12 V Power supply Lighting	65 €
1	24 V Power supply Engines	550 €
1	entrol TCPIP DI/DO Sensing Board	685 €
1	entrol TCPIP DI/DO Mini Sensing Board	735 €
1	entrol TCPIP Analog Sensing Board	675 €
1	entrol TCPIP Displays Sensing Board	705 €
1	entrol TCPIP Rele Sensing Board	320 €
	Price Level 2	**3.800 €**

15 Installation Requirements

15.1 Elements

The FNPT II MCC simulator is modular and is transportable in case of necessity. The trainer is composed of the following elements:

a) Cockpit

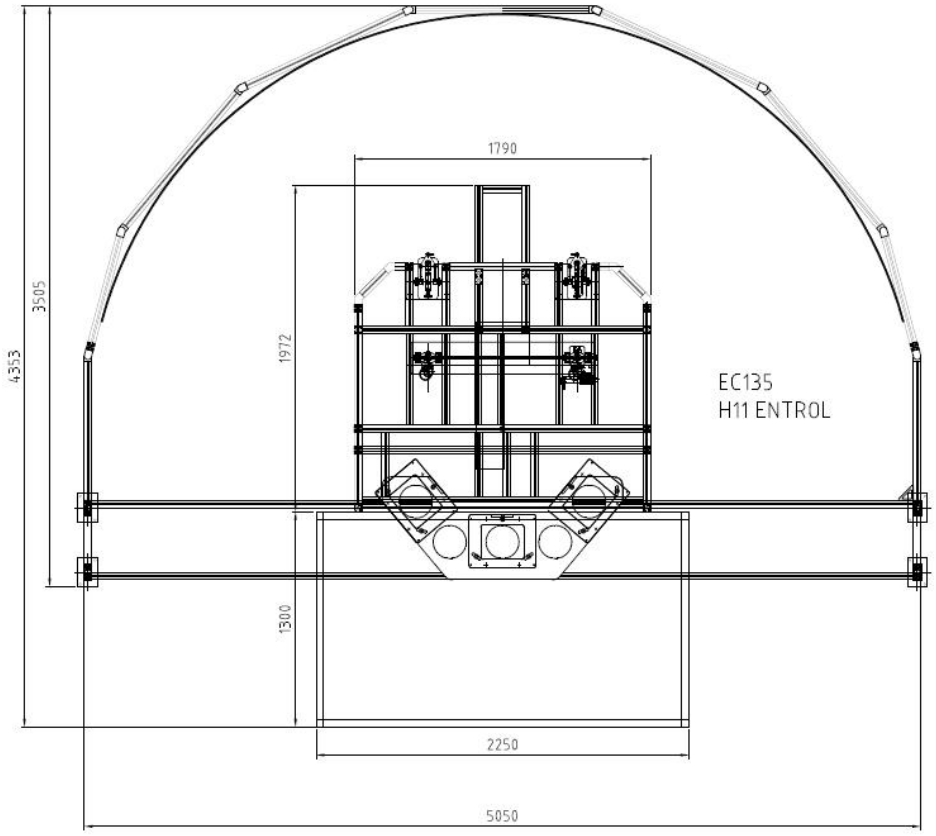
b) The instructor and observer section is located in the rear of the cockpit

c) Visual Projector Support Structure

d) Cylindrical Visual Screen

e) Computer Rack: The computers for visual and simulation are installed on the rack. The power entry and timers are located here. It has an ON-Line UPS system to protect the simulator from voltage fluctuations and power failures.

15.2 Graphical dimension of the elements installed (in mm)



- Cockpit size: 1800 (width) x 1980 (depth) x 1900 (height)
- Instructor Station : 1800 (width) x 1300 (depth) x 2300 (height)
- Visual structure and screen
    - Cylindrical system with 3 channels: 2500mm radius; 5100 (width) x 3000 (depth) x 2800 (height)

15.3 Weights

The approximate net weight of the cockpit is 550Kg, and and additional 160Kg with two pilots seated.

The trainer has to be installed on a flat and stable surface. The floor needs to be prepared to support the weight of the cockpit elements that will be distributed in four points--> wheels of 10cm radius.

15.4 Shipping & Access

- The simulator is shipped in crates in a standard truck.
- Forklifts and personnel for unloading the truck must be provided on-site by the customer.
- The **access door** to the room needs to have a **clear width of 2000 and 2400 height**, so the biggest box with the cockpit can be entered.
- It is responsibility of the customer to guarantee that the box can be entered, avoiding corners, etc.
- It is responsibility of the customer to have the equipment to unload the truck and insert the crates shall be present the day of the delivery.
- The specific room to install the simulator, sizes, access etc shall be communicated to entrol 2 months before installation to confirm all shipment details.
- entrol personnel is responsible for opening the crates and installing the simulator on the room, other works are not contemplated and local qualified personnel shall be managed by the customer.
- If there is any circumstance that shall not permit direct access o the simulator room it shall be communicated to entrol to manage the installation and consider any additional cost that may occur during installation.
- Packaging is property of the customer.

15.5 Room requirements (mm)

The simulator can be installed in a room of 5500 (width) x 5000 (depth) with a height of 3100.

entrol always recommends to send a drawing of the installation room to confirm measurements and simulator positioning.

15.6 Environmental and Power Requirements

- The Simulator is able to operate from 15 to 25 degrees Celsius
- The computers of the simulator are installed in a separate industrial rack
- The main power is 2x16 Ah (maximum) and 240 Volts
- The trainer has Uninterrupted Power Supply (UPS), to protect its components with a minimum input voltage range of –25% to +25% of Nominal Voltage (230V) installed on the rack
- Fire detection and extinguishing measures have to be addressed
- Air conditioning for 5 people and computer rack has to be installed
- Room painted black is recommended

entrol H11 fiber glass shell

16 Details & Conditions

16.1 entrol H11 / EC-135 FNPT II MCC

- Console and flight controls based on the **EC-135**
- **Fiber Glass Shell**
- **Glass Cockpit Configuration**
- **Dual Pilot IFR Configuration**
- **Crew seats with for-aft and vertical adjustment range**
- **Flight Control Loading System in Cyclic and pedals with digitally controlled engines**
- **Crew member seats with ample for-aft and vertical adjustment range to achieve authentic eye reference and ergonomic seating position for trainees with various heights**
- **FADEC Engine Control**
- **ENG 1 & ENG 2 Fire detection and suppression system.**
- **Category A criteria performance reserves, in case of an engine failure**
- **Radar: Wx and ARA**
- **4 Axis AP with Upper Modes**
- **TCAS I**
- **Backlight Panels**
- Dual Interlinked Cyclic & Collective
- Dual interlinked Throttle Grips (Eng1&Eng2)
- CAD, VEMD, FLI simulated
- **FMS Based on CDU UNS-1D**
- Offshore operation systems: Adelt, AHRS
- Functional Breaker Panel with 8 breakers tripped automatically
- **Digital Audio Matrix** for COM simulation
- entrol TCPIP Sensing board technology
- **3 Channel Cylindrical Full HD visual 150ºx40º**
    - Warping and Edge Blending system
    - Day/dusk/dawn/night modes
    - Obstacle sensing logic

- **entrol Standard and Estonian Airport & Navigation Database**
- entrol SID STARS database
- **Enclosed instructor station with dual 24" Tactile TFT**
  - Fuel quantity and mass and balance changes
  - Weather can be changed in real time including cloud base and RVR control and wind direction
  - Authentic icing effects
  - Lateral and vertical approach views
- **Automatic QTG's** on the Instructor Station that can be printed and saved
- Dual On-Line UPS Battery System
- Standard toolbox for recurrent maintenance
- Spare Part Set for basic elements of the simulator
- Simulated failures:
  - Engine
  - Fuel
  - Navigation
  - Flight Controls
  - Electrical
  - VEMD & CAD
  - FCDS
  - Other Systems
- **Shipping, Insurance, Installation and Testing in Estonian Aviation Academy**
- **Flight Instructors training for 2 instructors in Estonian Aviation Academy**
- **Maintenance Technicians training for 2 technicians in Entrol facilities**
- **On-site assistance to the initial certification for FNPT II MCC in Estonian Aviation Academy**
  - First version of MQTG document with flight data
  - Technical adjustments and configuration changes during MQTG development until all objective test results are in tolerance and subjective requirements are satisfied
  - Final version of MQTG document
  - Tools required to perform objective qualification tests provided
- **36 Months Warranty**