

Flight Training Device ATS-A320

Appendix B) Components Description

Reviewed: 20.02.2018

Model	Serial Number	Tail Number
ATS-A320		

Operator

Setup and instrument description of the Advanced Training System (ATS) A320, which includes the following sections, modules and instruments to simulate the A320 cockpit, on real dimensions, instruments and equipment.

Sections

01.- PLATFORM

02.- CENTER PEDESTAL

03.- FLIGHT INSTRUMENTS PANEL

04.- EQUIPMENT

05.- OVERHEAD PANEL

06.- MASTER INSTRUCTOR DESK

07.- SHELL (fuselage)

08.- EXTERNAL VISUAL SYSTEM

09.- PC's and SOFTWARE

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Section 01.- PLATFORM

1.- Cockpit Platform PRO (Cockpit, instructor station and cabinet section)

Manufactured with a structure of 2" x 1" tubular metals, supported by 12 detachable legs (real A320 external dimensions).

Floor cover on detachable 16 caliber aluminum.

Floor finish in synthetic Pirelli style rubber, black color and aluminum molding.

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Section 02.- CENTER PEDESTAL

1.- Central Console for Multifunction system

Framework manufactured in an aluminum layer, laser cut and finished on electrostatic oven painting.

This console is used by:

2.- Multipurpose Control Display Unit (MCDU)

MCDU A320 type, synchronized for both CAP and FO, which controls the FMGC's

3.- Switching panel

Operative Module for ATT HDG; EIS DMC switches; ECAM/ND

4.- Throttle Quadrant (motorized)

Motorized version of the component.

Operative in the following functions:

1. Pitch Trim Wheels
2. Trim position and CG scale
3. Reverser levers
4. Thrust levers for each engine
5. Thrust levers A/T disconnect

5.- ECAM Control Panel

Module with the following functions:

- 1- TO Config
- 2- System page keys
- 3- Emer Can key
- 4- ECAM Control Knobs
- 5- CLR key
- 6- STS key
- 7- RCL key
- 8- ALL key

6. - Radio Management Panel (RMP)

Radio Modules for CAP & FO

7. - Audio Control Panel (ACP)

Module of Audio Control Panel for CAP & FO

8. - Engine Start and Ignition Panel

Module with the following functions:

- 1- IGN/Start
- 2- Eng. Master Switch
- 3- Fire light
- 4- Fault

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9. - Weather Radar Control Panel

Module with the following functions:

- 1- SYS Switch
- 2- GAIN Knob
- 3- Mode Selector
- 4- TILT Knob
- 5- PWS Switch

10.- Transponder Control Panel

Operative Module

11.- Speed Brake Lever

Operative Module

12.- Flap Lever

Operative Module

13.- Rudder Trim Selector

Operative Module

14.- Landing Gear Gravity Extension Handle

Operative Module

15.- Parking Brake

Operative Module

16.- Flood panel CAP&FO

Operative Module

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Section 03.- FLIGHT INSTRUMENTS PANEL

1.- Main Instrument Panel Module (Cockpit & Glareshield)

Framework CNC built in 18 aluminum layers, laser cut. Set of lateral supports made of 1" metallic edges. Finished on oven electrostatic paint and modules manufactured on "micro surface impact acrylic" LASERMAX or similar, on grey and black colors.
Includes the following modules:

2.- Instrument Panel for CAP & FO

Module GPWs G/S light

3.- TERR on ND Switch. - CAP & FO

Operative Module

4.- Standby Instrument System

Integrated Standby Instrument System (ISIS)

Module indicator:

- 1- Pitch
- 2- Roll
- 3- Airspeed
- 4- Altitude
- 5- Magnetic Heading
- 6- Mach number
- 7- Pressure
- 8- Localizer
- 9- Glide Slope

5.- Display Units (PFD and ND) for CAP & FO sections

A) Primary Flight Display (PFD) is displayed, with the following information:

- 1- Airspeed Indications General. - Vmax; Green Dot Speed; Speed Indicators; Actual Airspeed; Reference line; Speed Trend Arrow; Target Airspeed Pointer and Mach Number
- 2- Flight Mode Annunciator. - Speed modes; Vertical modes; Navigation modes; A/P Landing and A/P engaged modes
- 3- Altitude Indication. - ILS Information; Pitch scale; Roll scale; Glide Slope deviation; Select Heading; ILS Course Pointer
- 4- Altitude Indication. - Target Altitude; Altitude Indication; Barometric reference; Analog Vertical Speed Pointer and Digital Vertical Speed Indication

B) Navigation Display (ND) is displayed, with the following information:

Ground Speed and True Airspeed indications

- 1- Navaid Display
 - 2- To Waypoint information
 - 3- Flight Plan Waypoint
 - 4- Arc mode range
 - 5- ILS/APP message
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6.- Chrono

Operative Module (including Backlight)

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7.- Primary Engine & Warning and System Displays

Displays the Electronic Centralized Aircraft Monitoring (ECAM), which contains the following information:

- 1- Door/Oxy screen
- 2- Hydraulic Pressure screen
- 3- Fuel screen
- 4- Electric screen
- 5- Cond screen
- 6- Bleed screen
- 7- Cabin Pressure screen
- 8- APU screen
- 9- Engine screen (upper)
- 10- Flight Control screen
- 11- Wheel screen
- 12- Cruise screen

8.- Landing Gear Lever & Autobrake module

Module with the following functions:

- 1- L/G level
- 2- Red Arrow
- 3- Landing Gear Lights
- 4- Autobrake Control Panel
- 6- BRK Fan Push Button
- 7- Anti-Skid/Nose Wheel Steering Switch

9.- Brake Pressure Indicator

Operative Module

10.- PFD/ND Brightness Control CAP&FO

Operative Module

11.- Datalink Control Display Unit (DCDU) CAP&FO

Operative Module

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Section 03.- FLIGHT INSTRUMENTS PANEL (Glareshield)

10.- Glare Wing modules CAP&FO

Operative Module

- 1- Autoland light
- 2- Master Warn
- 3- Master Caution
- 4- Chrono control
- 5- Side Stick priority

11.- Flight Control Unit & EFIS panel (FCUP) CAP&FO

Module FCUP with the following functions:

- 1- Speed/Mach knob and window
- 2- Speed/Mach switch
- 3- Heading/Track knob and window
- 4- Flight Director mode display and switch
- 5- LVL/CH light
- 6- V/S-FPA knob
- 7- Altitude knob and window
- 8- Autopilot switch
- 9- Auto throttle knob
- 10- LOC switch
- 11- APPR switch
- 12- EXPED switch

Module EFIS Control

- 1- Range selector
- 2- ND mode
- 3- Pressure selector

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Section 04.- EQUIPMENT

1.- CAP & FO Rudder System Pedals (synchronized)

Replica of the Airbus synchronized adjustable pedal system, manufactured on metal and aluminum, intended for rude use, finished on electrostatic oven paint, Power switches, switches and electronic card for assembly

Operative on:

- 1- Rudder Control (Yaw)
- 2- Nose Wheel Control
- 3- Independent Left and Right Brakes
- 4- Adjustable system

2.- CAP & FO Sidesticks

Replica of the Airbus Sidestick, manufactured on metallic materials and black fiber glass intended for rude use, finished on electrostatic oven paint, spring system and potentiometers

Operative on:

- 1- Pitch control
- 2- Roll control
- 3- A/P disconnect/Takeover button
- 4- PTT for communications

3.- Cockpit Lighting System

General lighting system composed by:

- 1- Adjustable cockpit
- 2- General lighting system with roof lamps and two available intensities (controlled from the overhead panel)
- 3- Instructor and cabinet section lamp
- 4- Lighting for the front section (used only for maintenance)

4.- Audio system

Audio system of 6.1 composed by 5 speakers, subwoofer and external output

5.- Crew Communications INTERCOM System

Internal communication system composed by 4 headsets (CAP, FO, OBSERVER and INSTRUCTOR), TELEX models or similar and INTERCOM system

6.- Seat Crew for CAP & FO

Replica of the original Airbus seat

7.- Electrical set, Low voltage supplies & Internet

For electric power management and control, the following power sources are used:

- 1- NO BREAK at 2000W (minimum), which allows the control and protection of the entire system. In case of an electric power shut down, the device grants 15 minutes to close session and turning off the equipment safely (its assembly is solely the responsibility of the operator)
- 2- Power source for low voltage energy (5,6,12 and 28 volts) required for electronic cards, system and watches

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8.- Sliding Table CAP & FO

Sliding table, manufactured on laser system and metallic components. Footrest pad system is included.

9.- Nosewheel Steering CTL (Tiller) CAP & FO

System for the directional control on land, manufactured on Black solid glass fiber and electronical system controls

10.- Horometer

Suitable for effective control of flight training device hours

11.- Reading light for CAP & FO

Lighting system for the Sliding table, integrated by lights, potentiometer and module manufactured on Lasermax

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Section 05.- OVERHEAD PANEL

1.- Upper, Lower & EXT Light & Engine Module

Modular system, manufactured on metal, finished on electrostatic oven paint and screws for module fixing. Support system attached to the main structure (front and back support), case made of micro surface impact acrylic LASERMAX or similar on Airbus colors, aluminum handles finished on electrostatic oven paint, leds and indicators, switches of multiple positions, switch covers on black and red colors, electronic cards for assembly and screws for fixing, containing:

2.- Circuit Breakers module

Module containing Circuit Breakers

3.- Pedestal Light

Pedestal light module

4.- ADIRS Panel

Module which contains:

- 1- On BAT light
- 2- Inertial Reference (IR) indicator light
- 3- Mode Select Unit (MSU) knobs
- 4- Airdata Reference (ADR) Push buttons

5. - Flight Control Panel

Module containing Flight Control push buttons

6.- Emergency Evacuation System

Inoperative Module

7.- Emergency Electrical power

Module which contains the Emergency Electrical Power

8.- GPWS Panel

Module operative for Terrain Function, System push button, GlideSlope mode, Flaps mode, and Landing Flaps 3 mode

9.- RCDR Panel

Inoperative Module

10.- Oxygen Mask panel

Inoperative Module

11.- Call Panel

Inoperative Module

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12.- Wiper/Rain Panel

Module containing:

- 1- Wiper rotary switch (simulated)
- 2- Rain RPLNT (inoperative)

13.- Fire Panel

Module containing Fire Panel

14.- Hydraulic Panel

Module with the following functions:

- 1- Engine Pump push button
- 2- RAT MAN On push button
- 3- Blue Electric Pump
- 4- PTU push button
- 5- Yellow Electric Pump push button

15.- Fuel Panel

Module for the fuel system control, with the following functions:

- 1- XFeed push button
- 2- Tank Pump push button
- 3- Mode Selector push button
- 4- Center Tank push button

16.- Electrical Panel

Module with the following functions:

- 1- Battery push button
- 2- Galley push button
- 3- Generator push button
- 4- IDG push button
- 5- AC Essential Feed push button
- 6- BUS TIE push button
- 7- APU Generator push button
- 8- BATT 1&2 indicator (simulated)
- 9- External Power push button

17.- Air Conditioning Panel

Module with the following functions:

- 1- Zone Temperature knobs
- 2- Hot Air button
- 3- Pack push button
- 4- Pack Flow knob
- 5- RAM Air push button
- 6- Engine Bleed push button
- 7- APU Bleed push button
- 8- X-Bleed knob

18.- Anti Ice Panel

Module with the following functions:

- 1- Wing Anti-Ice push button
- 2- Engine Anti-Ice push button
- 3- Probe/Window Heat push button

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19.- Cabin Pressure Panel

Module which contains the Cabin Pressure Panel

20.- External Lights Panel

Module with the following functions:

- 1- Strobe switch
- 2- Beacon switch
- 3- Wing Switch
- 4- NAV/LOGO Switch
- 5- Nose Switch
- 6- Landing Lights Switch
- 7- Runway Turnoff Switch

21.- APU Panel

Module with the following electric functions:

- 1- APU Master push button
- 2- APU Start push button

22.- Internal Light Panel

Operative Module only for Dome Switch

23.- Signs Panel

Operative Module for:

- 1- Seat Belt Switch
- 2- No Smoking Switch
- 3- Emergency Exit Switch

24.- Oxygen Panel

Inoperative Module

25.- Hydraulic Maintenance Panel

Module containing Hydraulic Maintenance

26.- ACP Panel

Inoperative Module (dummy)

27.- Flight Control Panel

Operative Module

28.- Cargo Heat/Smoke Panel

Inoperative Module

29.- Ventilation Panel

Module that contains the Ventilation panel

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30.- Engine Panel

Operative Module for:

- 1- Engine Manual Start
- 2- N1 Mode push button

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Section 06.- MASTER INSTRUCTOR DESK

1.- Instructor cabin Section

Area designated for the instructor, composed of:

- 1- Exclusive section at the back of the cabin (interior)
- 2- Working table, superior cabinet and lighting
- 3- PC with minimal specifications established in section 09 SOFTWARE & VARIOUS.
- 4- Control and supervision of all simulation and induction operations
- 5- 19" LCD monitors for control and information display (2 units)
- 6- Printer for maneuvers graphics and procedures performed
- 7- Cabinet suite

2.- Observer Section

Open section at the back of the cockpit, designated for the observer (jump seat), with a total vision of the Flight Deck and Visual

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Section 07.- SHELL (fuselage)

1.- Structural steel system (cockpit, instructor station & cabinet section)

Structural system for the cockpit, instructor station and cabinet sections, manufactured in a modular basis, on metallic 1"x1/2" base, finished on electrostatic oven paint.

Outside shield made of fiber glass finished on smelted paint (diverse colors), folding plastic black sheets, SFT logo, tail number and flight training device model (in both sides of the cockpit) and easy front opening for maintenance

2.- Set Windows system & template glass (6 windows)

Set of window system, 6mm temperate glass, rubber for adjustment and screws for assembly (upon real A320 aircraft dimensions)

3.- Interior panel system (complete)

Cockpit interior covered through panels, simulating those of the A320 aircraft, manufactured on fiber glass on diverse colors, set of plastic sheets and screws for assembly

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Section 08.- EXTERNAL VISUAL SYSTEM

1.- Visual system

Various visual system options, from large format LCD display to curved projection up to 210° x 45° viewable area

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Section 09.- PC's and SOFTWARE

1.- Computer system (4 PC's)

Computer rack system integrated by 4 PC's with the following functions:

- 1- Server PC, control Visual (PREPAR 3D), Networking and the software interface
- 2- CAP PC, controls the PFD, ND, ECAM screen (upper) and MCDU from CAP, Networking and Overhead panel
- 3- FO PC, controls the PFD, ND, ECAM screen (lower) and MCDU from FO, Networking and throttle console
- 4- Instructor PC, controls the "Instructor station" (failure system control, meteorological conditions, position, fuel, flight freeze and control of main system) using Instructor software, LNAV system profile, Network connection to obtain real time weather conditions and update data bases for the ND, CDU's and instructor station. Sound generator software for acoustic sounds, even on alarms and diverse sound advices and total control of equipment by the instructor
- 5- Software for remote technical control

** In CAP and FO computers, important files will be backed up in case of failure

Minimum equipment specifications in ATS-A320:

	SERVER	CAPTAIN SIDE	FO SIDE	INSTRUCTOR
Processor	INTEL CORE i7-7700 4.0 GHZ Quad-Core	INTEL CORE i5-6500 3.6 GHZ Quad-Core	INTEL CORE i5-6500 3.6 GHZ Quad-Core	INTEL CORE i5-6500 3.6 GHZ Quad-Core
Mother board	Asus Z270-A Prime	Ultra Durable Z170X- Gaming3	Ultra Durable Z170X- Gaming3	Ultra Durable Z170X- Gaming3
RAM Memory	16 GB, DDR4 at 2133MHz	8 GB, DDR4 at 2133MHz	8 GB, DDR4 at 2133MHz	8 GB, DDR4 at 2133MHz
Hard Disc	Solid State Drive of 480 GB Raid 1(dual)	Solid State Drive of 240 GB Raid 1(dual)	Solid State Drive of 240 GB Raid 1(dual)	Solid State Drive of 240 GB Raid 1(dual)
Video Card	8 GB NVidia GeForce GTX 1060 GDDR 5	4 GB NVidia GeForce GT 740 GDDR 5	4 GB NVidia GeForce GT 740 GDDR 5	4 GB NVidia GeForce GT 740 GDDR 5
Power Supply	750W	750W	750W	750W

2.- Systems Software

For the correct operation and management of the system, the following software is used:

- 1- FMGS PRO (Flight Management Guidance System) o similar emulator, logics and displays information for the PFD, ND and ECAM for CAP and FO (each computer has an independent professional user license) Airbus 1.9 or 2.0
- 2- FMGS PRO (Flight Management Guidance System) o similar, emulates and generates functions and capabilities of a MCDU
- 3- FMGS PRO (Flight Management Guidance System) o similar, emulates and generates functions and capabilities of a Flight Control Unit Panel (FCUP) synchronizing with aircraft systems
- 4- FMGS PRO (Flight Management Guidance System) o similar, emulates and generates functions and synchronizes FMGC of the FO with the CAP
- 5- FMGS PRO (Flight Management Guidance System) o similar, emulates and generates functions of the Overhead Panel
- 6- FMGS PRO (Flight Management Guidance System) o similar, emulates and generates functions if the instructor station
- 7- PREPAR 3D Professional visual generator and system motor integrator
- 8- Flight Simulator Universal Inter-Process Communication, software that allows synchronization between all installed software
- 9- Network Application Interface for FS software, which through Windows networking protocols, allows the interaction between installed applications and the 4 different PC'S
- 10- Software that configures and specifies the functions that should execute every module and component, as well as the interaction between them

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- 11- Aerodynamic profile and general specifications for the simulated A-320 aircraft. This information is related to the Reference Data Report (RDR) of the real aircraft
 - 12- Virtual Network Computing, allows the control of all applications installed on other computers from the instructor station, including the shut off and reset options
 - 13- FMGS PRO (Flight Management Guidance System) o similar, emulates and generates all acoustic signs for alarms and notices
 - 14- Software that presents NAV and VNAV flight profiles
 - 15- Software that allows through Internet access data bases, real time meteorological information
 - 16- Navdata (Navigraph) aeronautical navigation data base which is updated every 28 days, and installed in the MCDU, Glass Cockpit, Instructor's Station and Quickmap
 - 17- Software base on the web that allows technical assistance by remote control on either of the equipment
 - 18- Software PRO Instructor station, (fail system control, meteorological conditions, position, fuel, flight freeze and control of main system LNAV system profile, Network connection to update data bases for the ND, CDU's and instructor station, Sound generator software for acoustic sounds, even on alarms and diverse sound advices and total control of the equipment by the instructor
 - 19- Microsoft Window 10

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