A350
TECHNICAL TRAINING MANUAL
T1+T2 Mechanical and Avionics A350 RR TRENT XWB
GENERAL A/C SYSTEMS (LEVEL1)

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AIRCRAFT GENERAL INTRODUCTION

Overview

This general introduction gives data about the A350:
- Aircraft presentation
- Aircraft family
- Aircraft dimensions
- Aircraft general layout
- Aircraft weights.

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AIRCRAFT PRESENTATION

AIRCRAFT FAMILY

AIRCRAFT DIMENSIONS

A350 XWB GENERAL PRESENTATION

AIRCRAFT WEIGHTS

AIRCRAFT GENERAL LAYOUT

OVERVIEW

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AIRCRAFT GENERAL INTRODUCTION

Aircraft Presentation - Presentation

Function/Description

The aircraft definition includes:
- An airframe made of different types of materials with a large percentage of carbon composites
- Maximum cabin comfort:
- Wide cross-section
- Better cabin atmosphere
- Easy cabin reconfiguration:
- Optimized seat rails
- Quick fasteners
- Advanced cockpit:
- 6 interchangeable Liquid Crystal Display (LCD) display units
- Basic 180 min ETOPS (Extended Range Operations for Two Engine Aeroplanes) certification and 350 min with the full ETOPS options package
- Advanced wing design:
- Advanced aerodynamics
- Adaptive high-lift systems
- A380 experience in aircraft systems:
- Electro-Hydrostatic Actuators (EHA)/Electrical Backup Hydraulic Actuators (EBHAs)
- Integrated Modular Avionics (IMA)
- Advanced engines, twin engines:
- Less fuel consumption
- Low maintenance cost
- Low environmental impact.

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CARBON COMPOSITE AIRFRAME

EXTENSIVE USE OF CARBON COMPOSITE ON AIRCRAFT

MAXIMUM CABIN COMFORT

-WIDE CROSS-SECTION
-BETTER CABIN ATMOSPHERE

EASY CABIN RECONFIGURATION

-OPTIMIZED SEAT RAILS
-QUICK FASTENERS

ADVANCED COCKPIT

6 INTERCHANGEABLE LCD DISPLAY UNITS

ADVANCED ENGINES

-LESS FUEL CONSUMPTION
-LOW MAINTENANCE COSTS
-LOW ENVIRONMENTAL IMPACT

SYSTEMS: A380 AND BEYOND

-USE OF EHA/EBHA
-IMA

ADVANCED WING DESIGN

-ADVANCED AERODYNAMICS
-ADAPTIVE HIGH-LIFT SYSTEMS

ENHANCED ETOPS CAPABILITIES

ETOPS 180 MIN

EBHA: Electrical Backup Hydraulic Actuator
EHA: Electro-Hydrostatic Actuator
ETOPS: Extended Range Operations for Two Engine Aeroplanes
IMA: Integrated Modular Avionics
LCD: Liquid Crystal Display

AIRCRAFT PRESENTATION - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL INTRODUCTION

Aircraft Family - Presentation

Function/Description

The A350 XWB family has two aircraft standards: A350-900 and A350-1000.
The A350-900 is the basic aircraft standard.
The A350-1000 is longer than the A350-900:
- Plus 6 frames in the forward fuselage part
- Plus 5 frames in the aft fuselage part.

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A350-900

A350-1000

AIRCRAFT FAMILY - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL INTRODUCTION

Aircraft Dimensions - Presentation

Function/Description

All the dimensions are given for a maximum aircraft-weight configuration.

NOTE: Aircraft dimensions are given in meters, feet and inches.
The dimensions of the A350-900 are:
- Length: 66.80 m (219 ft 2 in)
- Width: 64.75 m (212 ft 5.2 in)
- Height: 17.05 m (55 ft 11.2 in).

The dimensions of the A350-1000 are:
- Length: 73.88 m (242 ft 4.5 in)
- Width: 64.75 m (212 ft 5.2 in)
- Height: 17.08 m (56 ft 0.3 in).

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A350-900 AIRCRAFT DIMENSIONS

AIRCRAFT DIMENSIONS - PRESENTATION - FUNCTION/DESCRIPTION

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A350-1000 AIRCRAFT DIMENSIONS

AIRCRAFT DIMENSIONS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL INTRODUCTION

Aircraft General Layout - Presentation

Function/Description

Engine power ratings
The engines for each standard have different power ratings for maximum performance:
- 84 Klbf for A350-900
- 97 Klbf for A350-1000.

Landing gear wheels
The A350-900 has 10 wheels.
The A350-1000 has 14 wheels.
Pressurized areas
The pressurized areas are:
- The cockpit
- The passenger compartment
- The cargo compartment.

Cabin layout
There are 2 different classes: Business Class (6 across) and the Economy Class (9 across).
The A350-900 has a capacity of 315 passengers:
- 48 Business Class
- 267 Economy Class.

The A350-1000 has a capacity of 369 passengers:
- 54 Business Class
- 315 Economy Class.

Cargo compartments
There are 3 different cargo compartments:
- The forward cargo compartment
- The aft cargo compartment
- The bulk cargo compartment.

The cargo compartment capacity is:
- 11 pallets and 36 containers for the A350-900
- 14 pallets and 44 containers for the A350-1000.

Doors
For all versions:
- There are four passenger doors on each side of the aircraft.
- The forward and the aft cargo doors are on the right side.
- The bulk cargo door is on the left side.

Avionics compartments
There are 2 major avionics compartments:
- The main avionics compartment where most of the aircraft computers are installed on three main avionics shelves (1000VU, 1100VU and 1200VU) and two main electrical shelves (for Electrical Power Distribution Centers EPDC1 and EPDC2).
The main avionics compartment is below the cockpit. Direct access to the main avionics compartment is possible from the cockpit or from the outside or the from the forward cargo compartment.
- The aft cabin underfloor compartment contains only two shelves: The In-Flight Entertainment Center (IFEC) rack and the connectivity rack. Access to the aft cabin underfloor compartment is possible from the bulk cargo compartment through a maintenance door.

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AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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NOSE GEAR WHEELS

MODEL	CONFIGURATION
A350-900	

NOSE GEAR WHEELS

MODEL	CONFIGURATION
A350-1000	

MAIN GEAR WHEELS

MODEL	CONFIGURATION
A350-900	

MAIN GEAR WHEELS

MODEL	CONFIGURATION
A350-1000	

AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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315 PASSENGERS

48 BUSINESS CLASS (6 ACROSS) **267 ECONOMY CLASS (9 ACROSS)**

A350-900

369 PASSENGERS

54 BUSINESS CLASS (6 ACROSS) **315 ECONOMY CLASS (9 ACROSS)**

A350-1000

AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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A350-900 Cargo compartment arrangements

AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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A350-1000 Cargo compartment arrangements

AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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A350 DOORS LOCATIONS

AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GENERAL INTRODUCTION

Aircraft Weights - Presentation

Function/Description

Aircraft weights
Each aircraft standard has different maximum weights related to its operating configuration and environment.
The A350-900 maximum weights are:
- The Maximum Taxi Weight (MTW): 268900kg
- The Maximum Take-Off Weight (MTOW): 268000kg
- The Maximum Landing Weight (MLW): 205000kg
- The Maximum Zero Fuel Weight (MZFW): 192000kg.

The A350-1000 maximum weights are:
- The Maximum Taxi Weight (MTW): 308900kg
- The Maximum Take-Off Weight (MTOW): 308000kg
- The Maximum Landing Weight (MLW): 233000kg
- The Maximum Zero Fuel Weight (MZFW): 220000kg.

Aircraft fuel quantities
The A350-900 fuel quantity is 138000l.
The A350-1000 fuel quantity is 156000l.

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MODEL	MAXIMUM TAXI WEIGHT (MTW)	MAXIMUM TAKE-OFF WEIGHT (MTOW)	MAXIMUM LANDING WEIGHT (MLW)	MAXIMUM ZERO FUEL WEIGHT (MZFW)
A350-900	268 900 kg	268 000 kg	205 000 kg	192 000 kg
A350-1000	308 900 kg	308 000 kg	233 000 kg	220 000 kg

MODEL	FUEL QUANTITIES
A350-900	138 000 l (36 460 US gal)
A350-1000	156 000 l (41 210 US gal)

AIRCRAFT WEIGHTS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT STATIONS, ZONING AND IDENTIFICATION INTRODUCTION

Overview

This section gives data about:
- The aircraft stations
- The aircraft zones
- The Functional Item Number (FIN)
- The Radio Frequency Identification (RFID).

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AIRCRAFT STATIONS

AIRCRAFT ZONES

A350 XWB STATIONS, ZONING AND IDENTIFICATION

RADIO FREQUENCY IDENTIFICATION

FUNCTIONAL ITEM NUMBER

OVERVIEW

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AIRCRAFT STATIONS, ZONING AND IDENTIFICATION INTRODUCTION

Aircraft Stations - Presentation

Function/Description

The fuselage structure has frames.
There is one station for each frame.
To measure the fuselage stations, the reference is the X datum line.
Station 0 (X=0) is the reference line for all structural measurements.
This reference is on the X axis:
- 5340 mm forward of the radome, for A350-900,
- 1530 mm forward of the radome, for A350-1000.

The fuselage station number shows the distance of a cross section from X=0 in millimeters.
The wing structure has ribs.
There is one station for each rib.
All the stations are parallel to the X axis of the aircraft.
Station 0 is at RIB1.
All measurements are:
- At 90 degrees to RIB1
- Between RIB1 and the intersection of each rib datum with the front spar datum.

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A350-900

AIRCRAFT STATIONS - PRESENTATION - FUNCTION/DESCRIPTION

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A350-1000

AIRCRAFT STATIONS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT STATIONS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT STATIONS, ZONING AND IDENTIFICATION INTRODUCTION

Aircraft Zones - Presentation

Function/Description

The aircraft is divided into zones to help maintenance and component location.
Each aircraft area is identified by a major zone ("hundreds" zone).
The aircraft is divided into eight major zones:
- 100 Lower half of the fuselage
- 200 Upper half of the fuselage
- 300 Stabilizers and rear fuselage section
- 400 Nacelles/pylons
- 500 Left wing
- 600 Right wing
- 700 Landing gears
- 800 Doors.

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AIRCRAFT ZONES - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT STATIONS, ZONING AND IDENTIFICATION INTRODUCTION

Functional Item Number (FIN) - Presentation

Function/Description

Each item of equipment on the aircraft has a Functional Item Number (FIN).
The basic part of the FIN is a two-letter code that shows which system/circuit the equipment is a part of (for example, 4GG4 in which GG is the code for a mechanical system/circuit).
For electrical equipment, the FIN is almost the same as a mechanical FIN, but the second letter of the system/circuit identifier is a Q (for example, GQ).
The code also has a prefix and a suffix to give the identification of each item of equipment.
The prefixes give the sequence number (4 digits).
The suffixes identify components which have the same function in the same circuit.
As a general rule, the suffixes show which side the component is on: an even-number suffix identifies a component on the right side and an odd-number suffix identifies a component on the left side.

NOTE: Some FIN numbers (access panels, access doors, etc.) obey different rules. They are a five-character code (3 digits and 2 letters), for example: 534AB.
- The first digit identifies the main zone (e.g. 500).
- The second digit identifies the main sub-zone (e.g. 530).
- The third digit identifies the unit zone (e.g. 534).
- The first letter gives the sequence identification (this starts with the letter A). On the wing, this letter increases from inboard to outboard.
- The second letter gives the location in the zone (e.g. B = Bottom).

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EXAMPLE OF FIN

EXCEPTIONS: SOME FIN NUMBERS HAVE DIFFERENT MEANING RULES (EX: ACCESS PANELS, COCKPIT PANELS...)

Functional Item Number (FIN)

4GG4
MNFOLD ASSY-BRK SV, MLG WHL 7 & 8

4 — **PREFIX (SEQUENCE NUMBER)**

GG — **CIRCUIT LETTERS CODE (RELATED TO ATA CHAPTERS)**

4 — **SUFFIX (COUNTER)**

FUNCTIONAL ITEM NUMBER (FIN) - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT STATIONS, ZONING AND IDENTIFICATION INTRODUCTION

Radio Frequency Identification (RFID) - Presentation

Function/Description

All the Line Replaceable Units (LRUs) have a tag that contains a micro-chip to identify them (designation, P/N, etc.).
These tags use Radio Frequency Identification (RFID) technology.
The data contained in the micro-chips is read (or written) with a reader (RFID reader/writer).

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Radio Frequency Identification (RFID)

- MICRO-CHIP IN A TAG TO STORE, TRANSMIT AND RECEIVE DATA (DESIGNATION, P/N, ETC...)
- DATA ON TAG IS READ (OR WRITTEN) AUTOMATICALLY WHEN TAG NEAR READER
- MULTIPLE TAGS READOUT AT SAME TIME

RFID

TAGS (TRANSPONDER) INSTALLED ON LRUs

AUTOMATIC DATA EXCHANGE

LRU: Line Replaceable Unit

RADIO FREQUENCY IDENTIFICATION (RFID) - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Overview

This topic gives data about the cockpit and includes:
- The cockpit commonality
- The cockpit layout
- The main instrument panel
- The glareshield
- The center pedestal
- The overhead panel
- The control panels.

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COCKPIT COMMONALITY

COCKPIT LAYOUT

CONTROL PANELS

MAIN INSTRUMENT PANEL

A350 XWB COCKPIT INTRODUCTION

OVERHEAD PANEL

CENTER PEDESTAL

GLARESHIELD

OVERVIEW

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AIRCRAFT COCKPIT INTRODUCTION

Cockpit Commonality - Presentation

Function/Description

The A350 general cockpit layout is based on a typical Airbus layout.

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COCKPIT COMMONALITY - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Cockpit Layout - Presentation

Function/Description

This topic shows the different panels in the cockpit:
- The overhead panel
- The glareshield
- The main instrument panel
- The center pedestal.

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COCKPIT LAYOUT - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Main Instrument Panel - Presentation

Function/Description

The main instrument panel includes six interchangeable Liquid Crystal Display units (LCD units). These are all the same and include:
- Two Electronic Flight Instrument System (EFIS) displays
- Electronic Centralized Aircraft Monitoring (ECAM) displays
- Multifunction Displays (MFDs)
- Two Onboard Information System (OIS) displays related to position and reconfigurations.

The Integrated Standby Instrument System (ISIS) indicator is on the front of the main instrument panel.

NOTE: The ISIS indicator on the right side is optional.

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ECAM: Electronic Centralized Aircraft Monitoring
EFIS: Electronic Flight Instrument System
ISIS: Integrated Standby Instrument System
MFD: MultiFunction Display
OIS: Onboard Information System

MAIN INSTRUMENT PANEL - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Glareshield - Presentation

Function/Description

The glareshield is immediately below the windshield. It includes an Automatic Flight System (AFS) control panel and two Electronic Flight Instrument System (EFIS) control panels.
The two sides of the glareshield have many indication devices (attention getters):
- The MASTER WARN and MASTER CAUT pushbutton switches
- The side-stick priority lights
- The WARN LT-AUTOLAND warning lights.

At each end of the glareshield, a POT-LOUDSPEAKER potentiometer and an ATC MSG pushbutton switch are installed.

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AFS: Automatic Flight System
EFIS: Electronic Flight Instrument System

GLARESHIELD - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Center Pedestal - Presentation

Function/Description

The primary controls on the center pedestal are related to the engines and engine thrust, communications, navigation and aircraft configuration.
The center pedestal includes two Keyboard and Cursor Control Units (KCCUs) for display control and interactivity.

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AESS:	Aircraft Environment Surveillance System
ECP:	Ecam Control Panel
KCCU:	Keyboard and Cursor Control Unit
L/G GRVTY EXTN:	Landing Gear Gravity Extension
LT:	Light
RMP:	Radio Management Panel

CENTER PEDESTAL - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Overhead Panel - Presentation

Function/Description

Most of the aircraft system controls are on the overhead panel.
This is a standard layout that uses Integrated Control Panels (ICPs).
For each system, the controls are on one ICP. The ICPs are installed to make normal and abnormal procedures easy and intuitive and thus keep crew errors to a minimum.
The main system controls are on the center of the overhead panel and the other controls are on the sides.
The systems most frequently used by the flight crew members are installed at the bottom part of the overhead panel.
There are no more circuit breakers in the cockpit, but system resets can be done from RESET panels/switches.
The top part of the overhead panel is for maintenance. Thus, on-ground maintenance operations can be done on some systems.

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ADIRS: Air Data/Inertial Reference System
APU: Auxiliary Power Unit
CDLS: Cockpit Door Locking System
CVR: Cockpit Voice Recorder
DFDR: Digital Flight Data Recorder
ELT: Emergency Locator Transmitter
F/CTL: Flight Controls
LT: Light
OIS: Onboard Information System

OVERHEAD PANEL - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT COCKPIT INTRODUCTION

Control Panels - Presentation

Function/Description

The A350 includes ICPs referred to as "VMs".
The ICPs are part of an aircraft system interface that uses digital and non-digital technologies.
This concept decreases weight, because it uses less wiring and gives better maintainability.
VUs are also installed. They use standard non-digital technology for some critical aircraft systems.

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VM
(NEW TECHNOLOGY)

BENEFITS

- LESS WIRING
- WEIGHT SAVING
- MAINTAINABILITY IMPROVED

225VM

- INTERFACE CREW WITH A/C SYSTEMS
- DIGITAL AND NON-DIGITAL MIXED TECHNOLOGY

VU
(CONVENTIONNAL TECHNOLOGY)

MATURE TECHNOLOGY

- INTERFACE CREW WITH A/C SYSTEMS
- NON-DIGITAL TECHNOLOGY

CONTROL PANELS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT DOCUMENTATION INTRODUCTION

Overview

The aircraft documentation includes:
- AirN@v products
- AirN@v access
- The new concept for documentation
- Maintenance and operational documentation hyperlinks
- The access philosophy for business categories
- Scheduled/unscheduled maintenance documentation.

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OVERVIEW

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AIRCRAFT DOCUMENTATION INTRODUCTION

AirN@v Products - Presentation

Function/Description

AirN@v has six applications, one customized and five non-customized. The customized application is AirN@v/Line, which contains the new business categories for the documentation.

NOTE: Applicability is given for Manufacturer Serial Numbers (MSN), not for Fleet Serial Numbers (FSN).

The non-customized applications are:
- AirN@v/Engineering, which includes the:
- Airworthiness Directive (AD)
- European Union Airworthiness Directive (EUAD)
- All Operators Telex (AOT)
- Flight Operations Telex (FOT)
- Operator Information Telex (OIT)
- Technical Follow-up (TFU)
- Service Bulletin (SB)
- Vendor Service Bulletin (VSB)
- Service Bulletin Information Telex (SBIT)
- Modification Information Document (MID)
- Modification Proposal (MP).
- AirN@v/Associated Data, which includes the:
- Standards Manual (SM)
- Consumable Material List (CML)
- Illustrated Tool and Equipment Manual (TEM).
- AirN@v/Planning, which includes the Maintenance Planning Document (MPD).
- AirN@v/Workshop, which includes the:
- Component Maintenance Manual (CMM)
- Duct and Fuel Pipe Repair Manual (DFPRM).
- AirN@v/Dispatch, which includes the:
- Minimum Equipment List (MEL)
- Configuration Deviation List (CDL).

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AD:	Airworthiness Directive	MP:	Modification Proposal
AOT:	All Operators Telex	MPD:	Maintenance Planning Document
CDL:	Configuration Deviation List	OIT:	Operator Information Telex
CML:	Consumable Material list	SB:	Service Bulletin
CMM:	Component Maintenance Manual	SBIT:	Service Bulletin Information Telex
DFPRM:	Duct and Fuel Pipe Repair Manual	SM:	Standards Manual
EUAD:	European Union AD	TEM:	Illustrated Tool and Equipment Manual
FOT:	Flight Operations Telex	TFU:	Technical Follow-up
MEL:	Minimum Equipment List	VSB:	Vendor Service Bulletin
MID:	Modification Information Document		

AIRN@V PRODUCTS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT DOCUMENTATION INTRODUCTION

AirN@v Access - Presentation

Function/Description

There is more than one procedure to get access to AirN@v data:
- On-line access from AIRBUSWorld, which is updated by Airbus
- Access directly on the aircraft from on-board terminals
- Access from a standalone PC
- On-line access from an airline intranet.

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ON-LINE FROM AIRBUSWorld

ACCESS ON THE A/C

ON-LINE FROM AIRLINE INTRANET

ACCESS FROM STANDALONE PC

AIRN@V ACCESS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT DOCUMENTATION INTRODUCTION

New Concept for Documentation - Presentation

Function/Description

For the A350 XWB, the concept of manuals (ATA standard) used until this time is replaced. The documentation is put into business categories to agree with the S1000D standard.
Because of this, as an alternative to manuals (AMM, TSM,...), Airbus supplies data modules (System Description, Maintenance Procedure, Fault Isolation,...) which are parts of the business categories directly related to the job.
All the manuals that were included in AirN@v/Maintenance (ATA standard) become part of AirN@v/Line (S1000D standard) as business categories, not as manuals.
The MPD, that was part of AirN@v/Planning as a manual, is also replaced in the S1000D standard by the Scheduled Tasks business category.

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AIR TRANSPORT ASSOCIATION → S1000D

MANUALS	BUSINESS CATEGORIES
AMM Aircraft Maintenance Manual	SYSTEMS DESCRIPTION MAINTENANCE PROCEDURE
TSM Trouble Shooting Manual	FAULT ISOLATION
IPC Illustrated Parts Catalog	MAINTENANCE IPD Illustrated Parts Data
WDM Wiring Diagram Manual	SCHEMATIC DIAGRAM WIRING DIAGRAM
ESPM Electrical Standard Practices Manual AMM ATA 20	ELECTRICAL STANDARD PRACTICES MECHANICAL STANDARD PRACTICES
SRM Structural Repair Manual	STRUCTURAL REPAIR IPD STRUCTURAL REPAIR INSTRUCTIONS
NTM Non-destructive Testing Manual	NDT Non-Destructive Test
MPD Maintenance Planning Document	SCHEDULED TASKS

AirN@v/ LINE
A350XWB

AirN@v/ Planning

AirN@v: ACCESS TO MANUALS REPLACED BY ACCESS TO BUSINESS CATEGORIES.

NEW CONCEPT FOR DOCUMENTATION - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT DOCUMENTATION INTRODUCTION

Maintenance and Operational Documentation Hyperlinks - Presentation

Function/Description

AirN@v/Dispatch includes hyperlinks with AirN@v/Line to get an easier access to the maintenance deactivation procedures.

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MAINTENANCE AND OPERATIONAL DOCUMENTATION HYPERLINKS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT DOCUMENTATION INTRODUCTION

Access Philosophy for Business Categories - Presentation

Function/Description

The S1000D standard uses a new concept: the business category concept which replaces the manuals. The result of this change is a new AirN@v graphical interface and organization.
To get access to the different business categories:
- Get access to the given BAABI item.
- Make your selection of the necessary business category.
- Look at the related data as for a standard manual.

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ACCESS PHILOSOPHY FOR BUSINESS CATEGORIES - PRESENTATION - FUNCTION/DESCRIPTION

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ACCESS PHILOSOPHY FOR BUSINESS CATEGORIES - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT DOCUMENTATION INTRODUCTION

Scheduled/Unscheduled Maintenance Documentation - Presentation

Function/Description

Maintenance operations on the aircraft can be:
- Scheduled maintenance
- Unscheduled maintenance.

Scheduled Maintenance
The AirN@v application related to scheduled maintenance is AirN@v/Planning. It includes the Scheduled Tasks business category which is related to the MPD.
Maintainability documents are:
- Certification Maintenance Requirements (CMR)
- Maintenance Review Board Reports (MRBR)
- Airworthiness Limitation Sections (ALS).

In-service return documents are:
- All Operators Telexes (AOT)
- Service Bulletins (SB)
- Airworthiness Directives (AD).

This maintenance planning document identifies all the tasks to be done on the aircraft with their related intervals, for nominal aircraft operability and airworthiness.
Unscheduled Maintenance
Unscheduled maintenance is the result of unscheduled events, for example failures, incidents and structural damage.
There are two possible strategies for unscheduled events:
- Operation in unusual conditions, which uses the Master Minimum Equipment List (MMEL) and Master Configuration Deviation List (MCDL) documents with inspections or deactivation procedures.
- Troubleshooting and repair.

For these two strategies, the AirN@v/Line application is the only tool used to do inspections/deactivations or troubleshooting and repair procedures.

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SCHEDULED/UNSCHEDULED MAINTENANCE DOCUMENTATION - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT E-OPERATIONS INTRODUCTION

Overview

This chapter gives data about:
- The paperless philosophy
- The Onboard Information System (OIS)
- Datalink communications.

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OVERVIEW

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AIRCRAFT E-OPERATIONS INTRODUCTION

Paperless Philosophy - Presentation

Function/Description

Paper documentation is replaced by an electronic library for operational and maintenance documentation. The electronic library is hosted in the Onboard Information System (OIS).
With the operational documentation, the flight crew can easily find the applicable information in the:
- Flight Crew Operating Manual (FCOM)
- Flight Manual (FM)
- Master Minimum Equipment List (MMEL)
- Master Configuration Deviation List (MCDL).

It gives access to data related to the mission, communications and performance computation.
The maintenance crew can directly get access to most of the maintenance documentation with the AirN@v/Line application which contains the following business categories:
- System Description and Maintenance Procedure
- Fault Isolation
- Maintenance Illustrated Parts Data (IPD)
- Schematics Diagram/Wiring Diagram
- Standard Practices - Electrical/Mechanical
- Structural Repair Illustrated Parts Data (IPD)/Structural Repair Instructions
- Non-Destructive Test (NDT).

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PAPERLESS PHILOSOPHY - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT E-OPERATIONS INTRODUCTION

Onboard Information System (OIS) - Presentation

Function/Description

The Onboard Information System (OIS) makes the electronic library available for the flight crew and maintenance crew.
Its function is to make airline operations and passenger services better and with a minimum of documentation for flight operations.
The flight crew uses the OIS display to get access to the OIS.
The maintenance crew uses the Onboard Maintenance Terminal (OMT) to get access to the OIS.
The maintenance documentation and applications are also available from the Portable Multipurpose Access Terminal (PMAT) or the OIS displays.
The flight crew and maintenance crew get access to e-documentation or to applications related from an electronic menu by the selection of flight or maintenance operations.

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ONBOARD INFORMATION SYSTEM (OIS) - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT E-OPERATIONS INTRODUCTION

Datalink Communications - Presentation

Function/Description

In flight, the aircraft uses the High Frequency (HF), the Very High Frequency (VHF) or SATellite COMmunication (SATCOM) for datalink communications.
On the ground, Wifi, wired connection and cellular communications are also available. These communications help to make aircraft operation and maintenance faster and more satisfactory, because there are better links between the aircraft and the ground facilities.

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DATALINK COMMUNICATIONS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Overview

This topic gives data about general safety precautions.

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A350 XWB SAFETY PRECAUTIONS INTRODUCTION

OVERVIEW

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Function/Description - Presentation

When you do work on or around the aircraft, you must know all the cautions and warnings.
To prevent all safety risks, it is necessary that:
- You obey all the safety precautions given in the business categories documentation.
- You obey the local regulations (national regulations, airline rules and airport rules).

These safety precautions prevent:
- Injuries to persons (Warning)
- Damage to the aircraft and to Ground Support Equipment (GSE) (Caution).

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FUNCTION/DESCRIPTION - PRESENTATION

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Maintenance Practices - Maintenance

Warnings and Cautions in Maintenance Procedures

When you do a maintenance procedure, it is necessary to obey the instructions given in the warnings and the cautions.
WARNING: Gives the materials, processes, methods, procedures or limits that you must use or obey to prevent the injury or death of persons.
CAUTION: Gives the methods and procedures that you must obey to prevent damage to equipment.

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CAUTION: GIVES THE METHODS AND PROCEDURES THAT YOU MUST OBEY TO PREVENT DAMAGE TO THE EQUIPMENT.

WARNING: GIVES THE MATERIALS, PROCESSES, METHODS, PROCEDURES OR LIMITS THAT YOU MUST USE OR OBEY TO PREVENT THE INJURY OR DEATH OF PERSONS.

4. Procedure

A. Add Oil to the APU Oil Reservoir

WARNING USE THE CORRECT PERSONAL PROTECTION.
OIL CAN HAVE ADDITIVE CALLED TRICRESYL PHOSPHATE IN IT. THIS CHEMICALS IS AN ASPHYSIANT, IT IS POISONOUS AND CAN BE ABSORBED THROUGH THE SKIN.
USE CARE WHEN ENGINE OIL IS DRAINED. HOT OIL CAN POSSIBLY CAUSE BAD BURNS.

CAUTION MAKE SURE THAT ALL PLUMBING IS FREE FROM OBSTRUCTION.

(1) Do an oil level check on the oil sight glass.

NOTE: If the oil level is at the FULL mark on the sight glass, do not add oil to the APU oil reservoir.

(2) Put the container in position below the APU gear box to collect oil leakage.

(3) Make sure that the oil scupper and the oil filler cap are clean. Make them clean with a lint-free cloth, if they are dirty.

(4) Open the oil filler cap.

MAINTENANCE PRACTICES - MAINTENANCE - WARNINGS AND CAUTIONS IN MAINTENANCE PROCEDURES

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Safety Precautions - Maintenance

Electrical Power and Electrostatic Charges

Electrical power and electrostatic charges can cause injury to maintenance personnel and damage to the components.
To prevent this, it is necessary to obey the precautions that follow:
- The aircraft must be earthed.
- The component bonding check must be completed.
- You must obey the discharge time delay applicable to some equipment.
- You must be careful when you work with energized components.
- If necessary, the system must be de-energized.

Radio Frequencies

Radio frequencies can cause radiation, which can cause injury to persons and/or cause fire and/or damage to equipment.
To prevent this, it is necessary to obey the precautions that follow:
- You must obey the precautions related to the safety areas.
- You must obey the precautions related to the operational areas.

The primary sources of radio frequencies are:
- The weather radar
- The High Frequency (HF) antennas.

Movable Parts

Movable parts can cause injury to persons and damage to the aircraft and/or GSE.
To prevent this, it is necessary to obey the precautions that follow:
- You must obey the precautions related to the safety areas.
- Inhibition and/or de-activation tasks must be done.

The primary movable parts are:
- The flight control surfaces
- The thrust reversers
- The doors
- The landing gears
- The Auxiliary Power Unit (APU) air-inlet flap
- The air-conditioning system elements (fuselage and wing root).

Noise

Noise can cause damage to hearing.
To prevent this, it is recommended to use ear protections and to obey the precautions related to safety areas.
The primary sources of noise are:
- The engines
- The APU
- The air conditioning system
- The hydraulic power system.

Suction and Exhaust Areas

The suction and exhaust areas can cause injury to persons and damage to the aircraft and/or GSE.
To prevent this, it is necessary to obey the precautions that follow:
- You must obey the precautions related to the safety areas.
- The areas must be kept clear.

The primary suction and exhaust sources are:
- The engines
- The APU
- The air conditioning/supplemental cooling system.

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SAFETY PRECAUTIONS - MAINTENANCE - ELECTRICAL POWER AND ELECTROSTATIC CHARGES ... SUCTION AND EXHAUST AREAS

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Safety Precautions - Maintenance (continued)

Pressurized Systems

Pressurized liquid, air, hydraulic and gas systems can cause injury to persons and damage to the aircraft and/or GSE.
To prevent this, it is recommended to:
- Do a check of the component pressurization when an indication is available.
- To depressurize the system when possible.
- Be careful when you do work with pressurized components when the system is not depressurized.

The primary pressurized systems are:
- The pneumatic system
- The air conditioning/supplemental cooling system
- The hydraulic power system
- The fire extinguishing system
- The oxygen system.

Special precautions are necessary with the cabin and cargo doors.
To prevent injury, before you open the cabin and/or cargo doors, do a check to see if the residual-cabin-pressure light is off.
For the escape slides, before you open the cabin doors, do a check to see if the emergency-escape-slide light is off.

Flammable and Explosive Products

Flammable and explosive products can cause fire and explosions and thus cause injury to persons and damage to equipment.
To prevent this, it is necessary to obey the precautions that follow:
- You must obey the precautions related to the safety areas.
- The applicable fire-extinguishing equipment must be available.
- You must obey the instructions related to the items that are not permitted (cigarettes, phones, cameras).

The flammable and explosive product is the fuel.

Poisonous Products

Different fluids used to operate the aircraft systems can cause injury to persons and damage to the aircraft.
Engine fuel and oils are poisonous if you breathe the fumes or get them in your mouth and they can cause environmental pollution.
To prevent this, it is necessary to obey the precautions that follow:
- You must use the applicable protective equipment.
- You must obey the material manufacturer's instructions and the local regulations when you do work with these products.
- After you use these products, you must obey the applicable cleaning procedures.
- You must not discard these products. You must put them in containers for recycling or retreatment.

The type of injury to persons or damage to aircraft caused by a solvent is related to its composition. You must always obey the safety precautions given in the instructions for use.
The type of injury to persons caused by carbon dust is related to different properties such as carbon fiber size, exposure time, etc. To prevent this, you must wear protective clothing.

Hot Components and Fluids

Hot components and fluids can cause burns and fires.
To prevent this, it is necessary to obey the precautions that follow:
- You must use the applicable protective equipment.
- You must obey the applicable time delay to let components become cool.
- You must obey the precautions related to the safety areas.
- You must do a check of the component temperature when an indication is available.

The primary systems that contain hot sources are:
- The engine system
- The pneumatic system
- The APU

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- The landing gear system
- The hydraulic power system
- The air conditioning system.

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SAFETY PRECAUTIONS - MAINTENANCE - PRESSURIZED SYSTEMS ... HOT COMPONENTS AND FLUIDS

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Safety Precautions - Maintenance (continued)

Heavy Components

When you move heavy components, there is a risk of injury to you or other persons because of their weight or if they fall. There is also a risk of damage to the aircraft.
To prevent this, it is necessary to obey the precaution that follow:
- You must use a correct body posture to lift heavy components.
- You must use special GSE, when applicable.
- You must use the special hoisting points installed on the aircraft, when applicable.
- It is not permitted to walk below a lifted load.

Elevated Work Areas

Persons or items of equipment that fall from high positions can cause injury to other persons and damage to the aircraft.
To prevent this, it is necessary to obey the precautions that follow:
- You must use the safety points.
- You must use the safety handles.
- You must use the safety harnesses.
- You must use the correct platforms.

Read the manufacturer's instructions for the platform. You must know the applicable local regulations.

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SAFETY PRECAUTIONS - MAINTENANCE - HEAVY COMPONENTS & ELEVATED WORK AREAS

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AIRCRAFT SAFETY PRECAUTIONS INTRODUCTION

Safety Precautions - Maintenance (continued)

Optical Fiber

Optical fiber can cause injury to persons.
It is dangerous to look into the end of a fiber-optic cable. There is a risk of laser radiation which the operator will not see.
Laser radiation is dangerous for the eyes.
It is also important that you do not get optical fiber pieces below your skin.

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SAFETY PRECAUTIONS - MAINTENANCE - OPTICAL FIBER

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AIRCRAFT GROUND HANDLING INTRODUCTION

Overview

This section gives data about the ground handling procedures and includes:
- Turnaround
- Lifting and Shoring
- Leveling and Weighing
- Towing and Taxiing
- Parking/Mooring, Storage, and Return to Service
- Placards and Markings
- Servicing.

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OVERVIEW

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AIRCRAFT GROUND HANDLING INTRODUCTION

Turnaround - Presentation

Function/Description

The standard turnaround time is approximately 60 minutes.
The A350 has a typical ramp layout and includes:
- External Ground Power Units (GPU)
- Catering/cleaning trucks
- A pallet/container loader
- Refueling trucks
- A waste water vehicle
- A conveyor belt
- A potable water vehicle
- An air conditioning unit.

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TURNAROUND TIME ≃ 60 MINUTES

TURNAROUND - PRESENTATION - FUNCTION/DESCRIPTION

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TURNAROUND - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GROUND HANDLING INTRODUCTION

Lifting and Shoring - Presentation

Function/Description

The aircraft can be lifted on jacks for maintenance operations.

NOTE: The data related to lifting is given in ATA chapter 07-11-00.
To release mechanical stress on the fuselage and wings, aircraft shoring must be done before structural repairs.

NOTE: The data related to shoring is given in ATA chapter 07-20-00.

Location

The aircraft has three primary jacking points:
- Below the forward fuselage, on the left side, aft of the Nose Landing Gear (NLG)
- Below each wing.

There is a safety stay point below the aft fuselage for safety, to prevent tail tipping caused by accidental movement of the aircraft Center of Gravity (CG).
There are shoring points on dedicated frames and ribs. The location of these shoring points are given in ATA chapter 07-20-00.

Tools - Maintenance

Specific adaptors are necessary to lift the aircraft. A spherical nose jack adaptor and two wing jack adaptors are used between the aircraft jacking points and the jack. A spherical adaptor is used with the safety stay.
There are special shoring kits for aircraft shoring.

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THE DATA RELATED TO JACKING IS GIVEN IN ATA CHAPTER 07-11-00

SHORING KIT PRINCIPLE

THE DATA RELATED TO SHORING IS GIVEN IN ATA CHAPTER 07-20-00

LIFTING AND SHORING - PRESENTATION & TOOLS - MAINTENANCE

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AIRCRAFT GROUND HANDLING INTRODUCTION

Leveling and Weighing - Presentation

Function/Description

There are three alternative procedures to make the aircraft level:
- Quick leveling procedure from the Onboard Maintenance Terminal (OMT)
- Quick leveling procedure with a spirit level in the passenger compartment
- Quick leveling procedure with a spirit level in the forward cargo compartment.

NOTE: The data related to leveling is given in ATA chapter 08-20-00.

You can weigh the aircraft with:
- The aircraft on jack
- The aircraft on wheels.

A scale is put below each landing gear to weigh the aircraft. The total scaling gives the final weight of the aircraft.

NOTE: The data related to weighing is given in ATA chapter 08-10-00.

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AIRCRAFT QUICK LEVELING IN CABIN
(WITH SPIRIT LEVEL)

THE DATA RELATED TO LEVELING IS GIVEN IN ATA CHAPTER 08-20-00

THE DATA RELATED TO WEIGHING IS GIVEN IN ATA CHAPTER 08-10-00

AIRCRAFT QUICK LEVELING FROM THE COCKPIT
(WITH THE ONBOARD MAINTENANCE TERMINAL)

AIRCRAFT QUICK LEVELING IN FORWARD CARGO
(WITH SPIRIT LEVEL)

2 METHODS:
- AIRCRAFT ON JACKS
- AIRCRAFT ON ITS WHEELS.

AIRCRAFT WEIGHING

LEVELING AND WEIGHING - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GROUND HANDLING INTRODUCTION

Towing and Taxiing - Presentation

Function/Description

You can tow the aircraft with:
- A towbar
- A towbarless tractor.

You must connect the towbar to the NLG structure.

NOTE: The data related to towing is given in ATA chapter 09-10-00.
There is a new function for the A350 XWB to make towing easier when the aircraft is electrically energized by the battery only.
The graphic that follows shows the aircraft turning capability in good operating conditions.

NOTE: The data related to taxiing is given in ATA chapter 09-20-00.

Safety Precautions - Maintenance

If you are in the aircraft during towing and taxiing operations (low-speed operations included), you must be in a seat with your seat belt attached. If you do not obey this instruction, injury can occur.

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NOTE:
AIRCRAFT CONDITIONS:
SYMMETRIC THRUST AND NO BRAKING

THE DATA RELATED TO TOWING IS GIVEN IN ATA CHAPTER 09-10-00

THE DATA RELATED TO TAXIING IS GIVEN IN ATA CHAPTER 09-20-00

IF YOU ARE IN THE AIRCRAFT DURING TOWING AND TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), YOU MUST BE IN A SEAT WITH YOUR SEAT BELT ATTACHED.
IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY CAN OCCUR.

WARNING

MINIMUM TURNING WIDTH	
A350-900	51.0 m (167 ft 3.9 in)
A350-1000	56.0 m (183 ft 8.7 in)

TOWING AND TAXIING - PRESENTATION & SAFETY PRECAUTIONS - MAINTENANCE

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AIRCRAFT GROUND HANDLING INTRODUCTION

Parking and Mooring - Presentation

Function/Description

ATA chapter 10-11-00 includes parking procedures that give the number of days or weeks and the conditions in which an aircraft must be parked. These procedures include:
- Parking of the aircraft in flight-ready condition
- Ground checks during parking
- Return to operation after parking
- Renewal of parking procedures.

ATA chapter 10-20-00 includes the mooring procedure to prevent movement of the aircraft when it is not stable in high wind conditions. The aircraft is moored at the NLG level with a mooring kit.

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PARKING

REFER TO ATA CHAPTER 10-11-00 FOR:
-PARKING OF THE AIRCRAFT IN FLIGHT-READY CONDITION
-GROUND CHECKS DURING PARKING
-RETURN TO OPERATION AFTER PARKING
-RENEWAL PARKING PROCEDURES.

MOORING KIT

MOORING

REFER TO ATA CHAPTER 10-20-00 FOR MOORING PROCEDURE

PARKING AND MOORING

PARKING AND MOORING - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GROUND HANDLING INTRODUCTION

Storage and Return to Service - Presentation

Function/Description

The storage procedure for a period of not more than 6 months (refer to ATA chapter 10-31-00) includes these reference procedures:
- Periodic ground checks during storage 7-day intervals, 15-day intervals, 1-month intervals and 3-month intervals (refer to ATA chapter 10-31-00)
- Return to operation after storage (refer to ATA chapter 10-40-00)
- Renewal of storage procedure for a period of not more than 6 months only one more time (refer to ATA chapter 10-31-00).

NOTE: During storage or parking periods, it is not permitted to stop or change the maintenance program without local authority approval. The maintenance calendar clock continues during these periods.

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AIRCRAFT STORAGE/RETURN TO SERVICE

REFER TO ATA CHAPTER 10-31-00 FOR STORAGE PROCEDURE
REFER TO ATA CHAPTER 10-40-00 FOR RETURN TO SERVICE PROCEDURE

NOTE:
DURING STORAGE OR PARKING PERIODS, IT IS NOT PERMITTED TO STOP OR CHANGE THE MAINTENANCE PROGRAM WITHOUT LOCAL AUTHORITY APPROVAL. THE MAINTENANCE CALENDAR CLOCK CONTINUES DURING THESE PERIODS.

STORAGE AND RETURN TO SERVICE - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GROUND HANDLING INTRODUCTION

Placards and Markings - Presentation

Function/Description

Commercial transport aircraft have a large number of markings and placards on their external surface and in the cabin. Their function is to:
- Give warnings about dangers
- Give instructions
- Give the location of equipment.

Markings and placards are written for targeted populations, which can be from different cultures and with different skills.
The internal instructions are given as written markings.
Placards that use pictograms help to:
- Prevent the problem of accurate translation for many languages.
- Remove ambiguities in verbal phrases and their interpretation.
- Decrease the work to keep placards and manuals consistent.
- Get a fleet-wide commonality.
- Decrease training for crews because of the similarity with non-aviation symbols.
- Make new placards not necessary after operator change.
- Give aid to dyslexic people to get the information.
- Make placards easier to read at a distance and in bad lighting conditions.

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CARGO DOOR OPENING/CLOSING PICTOGRAM

INTERNAL INSTRUCTIONS

CABIN RESIDUAL PRESSURE PICTOGRAM

LIFE VEST LOCATION PICTOGRAM

- NO NEED FOR TRANSLATION
- EASY INTERPRETATION
- SIMILARITY WITH NON-AVIATION SYMBOLS
- FLEET-WIDE COMMONALITY
- DYSLEXIC PEOPLE CAN RECEIVE THE INFORMATION
- BETTER LEGIBILITY (DISTANCE, POOR LIGHTING)

PLACARDS AND MARKINGS - PRESENTATION - FUNCTION/DESCRIPTION

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AIRCRAFT GROUND HANDLING INTRODUCTION

Servicing - Presentation

Location

The illustration shows the external standard service-points.
These service points are:
- The cargo control panel
- The cargo-door control panel
- The electrical ground power
- The fuel couplings
- The high-pressure air
- The low-pressure air
- The potable water
- The refuel/defuel control panel
- The waste water
- The Engine oil servicing
- The Variable Frequency Generator (VFG) oil servicing
- The hydraulic service panels.

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1 - CARGO CONTROL PANEL

2 - CARGO-DOOR CONTROL PANEL

3 - ELECTRICAL GROUND POWER

4 - FUEL COUPLINGS

5 - HIGH PRESSURE AIR

6 - LOW PRESSURE AIR

7 - POTABLE WATER

8 - REFUEL/DEFUEL CONTROL PANEL

9 - WASTE WATER

10 - ENGINE OIL SERVICING

11 - VFG OIL SERVICING

12 - HYDRAULIC SERVICING

VFG: Variable Frequency Generator

SERVICING - PRESENTATION - LOCATION

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AIRCRAFT GROUND HANDLING INTRODUCTION

Maintenance Practices - Maintenance

Do not release products such as oil, fuel, solvents or lubricants in trash bins, soil or into the water network (drains, gutters, rain water, waste water, etc.).
Collect the different waste fluids in special waste disposal containers related to each type of waste fluid.
Each product must be stored in an applicable and special cabinet or room such as a fire-resistant and sealed cupboard.
Do not use the Auxiliary Power Unit (APU) if APU bleed air is not necessary. Stop the ground service equipment (GPU, air conditioning cart, etc...) if you do not do work with this equipment or if no persons are in the aircraft.

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LIMIT GAS EMISSIONS

FLUID SPILL CLEANUP KIT

AVOID FLUID SPILLAGE
USE APPROPRIATE STORAGE EQUIPMENT FOR CHEMICAL PRODUCTS
LIMIT AIR POLLUTION (EXHAUST SMOKE, GAS EMISSIONS...)

STORE PRODUCTS IN APPROPRIATE CONTAINER/CUPBOARD/ROOM

USE SPECIFIC WASTE DISPOSAL CONTAINERS

SORT WASTE FLUIDS IN CONTAINERS

MAINTENANCE PRACTICES - MAINTENANCE

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TURNAROUND PRESENTATION

Turnaround Presentation

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TURNAROUND PRESENTATION

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FINAL ASSEMBLY LINE PRESENTATION

Final Assembly Line Presentation

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FINAL ASSEMBLY LINE PRESENTATION

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AIRCRAFT SECURITY AWARENESS

SECURITY AWARENESS OBJECTIVES

The introduction of new features on new aircraft has led to the need for the interconnection of systems as well as the introduction of Commercial Off-The-Shelf (COTS) hardware and software used by Flight Operations, Maintenance entities, and passengers.
Therefore, the management of these applications in terms of secure access, software, or data updates and security incidents is fundamental.
Also, new security threats have emerged which must be addressed by security measures.
The Security Handbook is a collection of organizational security measures that are widely, distributed in the Aircraft Operating manuals (Flight Crew Operating Manual (FCOM), Cabin Crew Operating Manual (CCOM), Maintenance Procedures (MP)). It provides the Aircraft Operator with a transversal view of needs to maintain the aircraft in-service security level without analysing the customer manuals.
In addition, the Security Handbook provides a consistent context for the organizational security measures and supplements information that cannot be included in the customer manuals.

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OBJECTIVES

- UNDERSTAND THE NEED FOR SECURITY MANAGEMENT
- KNOW THE BASIC PRINCIPLES OF A350 XWB SECURITY
- KNOW WHERE TO FIND GUIDANCE AND SUPPORT
- ALL SECURITY MANAGEMENT RECOMMENDATIONS IN SECURITY HANDBOOK

SECURITY AWARENESS OBJECTIVES

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AIRCRAFT SECURITY AWARENESS

A350 WXB IT SECURITY GENERALITIES

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A350 XWB IT SECURITY GENERALITIES

IN-SERVICE SECURITY MANAGEMENT

A350 WXB IT SECURITY GENERALITIES

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AIRCRAFT SECURITY AWARENESS

SECURITY VERSUS SAFETY

We call safety everything related to hazard events able to affect material and people.
The security concerns the presentation of threats (deliberate malicious acts) aiming at affecting Safety, Business or Image.
Safety is everything related to fortuitous (unexpected) events able to affect material and people (aircraft design, maintenance...).
Guaranteeing Safety is the baseline of the A/C Type Certification.
Security concerns the prevention of deliberate malicious acts aiming at affecting aircraft or people (hacking, hijacking, bombs...).
The current system safety assessment policies & techniques do not address potentials cybersecurity vulnerabilities.
A special condition (CRI F38 = Certification Review item = Special Condition) asks to protect Aircraft systems and networks from Security threats. It basically requires the manufacturer to assess risks of cyberattacks on information management system and if needed, protection mechanism must be installed.
Security aspects of continuous airworthiness are addressed via instructions or handbooks to operators and are a key element to maintain an acceptable level of security.
Deliberate actions impacting security may drive to a safety issue. Cyber security recommendations are new for the A350 to get the TC.

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SECURITY VERSUS SAFETY

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AIRCRAFT SECURITY AWARENESS

NEED FOR AIRCRAFT SECURITY MANAGEMENT

Definition of E-enabled Aircraft:
The aircraft are becoming more digital and more automated, and communicating more externally. This increasing level of communications is driven primarily by the need to accommodate more aircraft safely in our skies.
An E-enabled Aircraft is an aircraft with some type of 'network connections' (i.e., higher-bandwidth data communications). These aircraft need some level of increased network security requirements in order to protect the data being sent and received.
Also it is an aircraft that has one or more networks on board (AFDX,...) and requires a connection to external networks (airborne and/or ground based) to assist with its operation.
The A380 and A350 are E-enabled aircraft with the introduction of new technologies to support flight operations, cabin management, passenger services and maintenance.
Introduction of Commercial Off-The-Shelf (COTS) hardware and software used by Flight Operations, maintenance entities, and passengers.
The main novelty is the use of digital system architecture composed of several interconnected systems / networks / domains:
- Flight safety related control, communication and navigation systems (Aircraft Domain with all avionics systems),
- Airline business and administrative support,
- Passenger information and entertainment,
- Flight Crew and Cabin Crew domains.

There is a concern that these networks may be subject to unauthorized access.

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WHY AIRCRAFT SECURITY ?

E-ENABLED AIRCRAFT (A380, A350) INTRODUCED NEW TECHNOLOGIES TO SUPPORT:

- FLIGHT OPERATIONS
- CABIN MANAGEMENT
- PASSENGER SERVICES AND MAINTENANCE

- EVOLUTION OF AVIONICS TOWARDS A MORE INTEGRATED ENVIRONMENT
- AVIONICS SYSTEMS ARE MORE COMPLEX, STANDARDIZED, DOCUMENTED, CONNECTED

➤ NEED TO PROTECT AVIONICS SYSTEMS

NEED FOR AIRCRAFT SECURITY MANAGEMENT

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AIRCRAFT SECURITY AWARENESS

NEED FOR AIRCRAFT SECURITY MANAGEMENT

The A350 XWB Security Handbook is a single guide for in-service security management of the aircraft.
Security Handbook is targeted to aircraft security stakeholders of customers (including maintenance organizations) operating A350 aircraft type.
The A350 XWB Security Handbook provides recommendations and instructions to maintain the security level of the aircraft.

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WHY AIRCRAFT SECURITY ?

AIRCRAFT SECURITY IS CONCERNED WITH **DELIBERATE** MALICIOUS ACTS AFFECTING AIRCRAFT OR PEOPLE

EASA
European Aviation Safety Agency

AIRWORTHINESS AUTHORITIES ISSUED NEW SECURITY REQUIREMENTS

A350 XWB SECURITY HANDBOOK PROVIDES SECURITY GUIDELINES TO OPERATORS AND MAINTENANCE AND REPAIR ORGANISATION (MRO)

NEED FOR AIRCRAFT SECURITY MANAGEMENT

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AIRCRAFT SECURITY AWARENESS

IT SECURITY THREATS

In flight, the aircraft uses the High Frequency (HF), the Very High Frequency (VHF) or SATellite COMmunication (SATCOM) for datalink communications.
On the ground, WIFI, wired connection and cellular communications are also available. These communications help to make aircraft operation and maintenance faster and more satisfactory, because there are better links between the aircraft and the ground facilities.
Passenger connectivity uses SATCOM for datalink communications.
The main concern is that these networks may be subject to unauthorised access.

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IT SECURITY THREATS

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AIRCRAFT SECURITY AWARENESS

MAIN THREAT VECTORS

Main threat vectors:
- Compromise of data loads installed on the A/C,
- Mobile devices connected to A/C (e.g. USB key, PMAT, EFB, Cabin Crew),
- Attacks on wireless connections,
- Attacks from Passenger owned devices,
- Unauthorized access to systems or plugs.

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MAIN THREAT VECTORS

COMPROMISE OF **DATA LOADS** INSTALLED ON THE A/C

MOBILE DEVICES CONNECTED TO A/C (E.G. USB KEY, PMAT, EFB, CABIN CREW)

ATTACKS ON **WIRELESS** CONNECTIONS

ATTACKS FROM **PASSENGER OWNED DEVICES**

UNAUTHORIZED ACCESS TO SYSTEMS OR PLUGS

MAIN THREAT VECTORS

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AIRCRAFT SECURITY AWARENESS

PROTECTION PRINCIPLES

Protection principles:
- Technical measures in the A/C design (smart diode, firewall, Virtual Private Network (VPN), proxy, audit function...),
- Digital Certificates for software protection,
- Domain segregation / Protection of interfaces,
- Guidelines to maintain the A/C security level (Security Handbook),
- Incident and Vulnerability management,
- Security for Ground Support Information Systems.

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PROTECTION PRINCIPLES

TECHNICAL MEASURES IN THE A/C DESIGN
(SMART DIODE, FIREWALL,VPN...)

DIGITAL CERTIFICATES FOR SOFTWARE PROTECTION

DOMAIN SEGREGATION / PROTECTION OF INTERFACES

GUIDELINES TO MAINTAIN THE A/C SECURITY LEVEL
(SECURITY HANDBOOK)

INCIDENT AND VULNERABILITY MANAGEMENT

SECURITY FOR GROUND SUPPORT INFORMATION SYSTEMS

PROTECTION PRINCIPLES

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AIRCRAFT SECURITY AWARENESS

USAGE OF DIGITAL CERTIFICATES FOR A350

Digital Certificates is a widely used technology used to encrypt and digitally sign data or authenticate users / devices before opening secure communications. Throughout the aerospace industry, the Digital Certificates have been introduced in information systems to fulfil sensitive security requirements such as:
- Strong authentication of internal crew wireless systems and devices involved in air to-ground communications,
- Guaranteeing origin and integrity of uploaded software or document,
- Non-repudiation of transactions.

AIRBUS can issue digital certificates authorizations to people and devices for Airlines, Suppliers, MRO and within Airbus.
Usage of Digital Certificates for A350:
- Data loading (Import Field Loadable Software (FLS) or User Modifiable Software (UMS) on board the Aircraft). All FLS have a digital signature,
- Information Management Aircraft Communication System (IMACS) is a ground & flight (IMACS Ground and IMACS on A/C) server whose function is to secure any wireless IP communication between A/C and Airline servers. For that IMACS is able to set up a Virtual Private Network (VPN),
- Gatelink communication: Wireless Aircraft Communication system (WACS) for WIFI and Cellular communications between Aircraft and Airline ground network. The Digital certificates give data protection for WACS communications,
- Cabin Crew Mobile Device (CCMD) for wireless communications in cabin.

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SUPPLIERS, AIRBUS, MRO, AIRLINES (ENGINEERING, FLIGHT OPERATION, IT DEPARTMENTS) HAVE DIGITAL CERTIFICATES AUTHORIZATIONS

USAGE OF DIGITAL CERTIFICATES FOR A350

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AIRCRAFT SECURITY AWARENESS

USAGE OF DIGITAL CERTIFICATES FOR A350

Protection principles:
- A digital certificate allows establishing a secure communication channel in order to protect Data Authenticity, Integrity and Confidentiality.
- Any Field Loadable Software (FLS) uploaded into the Aircraft uses the digital signature check.
- For the IP communication the certificates are used to set up a Virtual Private Network (VPN) in order to protect the communication and to sign the data transmitted through this channel. In addition, for these wireless communications via WIFI and SATCOM, the data are encrypted.

IP Communication relies on Information Management Aircraft-ground Communication System (IMACS) software. The role of the IMACS is to provide a secure software interface to allow aircraft hosted applications to transparently connect with their counterparts on ground (located in the airline network, an airport infrastructure, the public internet, or supplier facilities) by using a VPN process.

IMACS supports:
- cockpit crew operations,
- cabin crew operations,
- passenger communications,
- maintenance operations.

IMACS communicates:
- In flight and on ground through SATCOM,
- On ground through Gatelink with the WACS (Wireless Airport Communication System): WIFI, Cellular, Wired Gatelink.

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SOFTWARE PROTECTION RELIES ON DIGITAL CERTIFICATES

USAGE OF DIGITAL CERTIFICATES FOR A350

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AIRCRAFT SECURITY AWARENESS

FLS LOADING VIA USB KEY OR LRU INSTALLATION

Data Loading with USB key or via LRU installation.
The Airbus tool Load Secure Batch media (LSBM) allows:
- to sign a FLS load after FLS creation,
- to check a FLS digital signature (at reception of a FLS from a supplier by an Airline for example).

1 - Supplier or Airbus FLS
The Airline or Maintenance Organisation must check the load signature before using it.
Recommendation: use of a specific Ground Tools Load Signature to check the load before storing and before sending it to the A/C.
Then check of the validity and time of the FLS signature is done within the A/C by security software.
2 - Airline FLS customization
Airlines can customize loads. The Airline must use a FLS signer tool (to sign MEL, CDL, ACMS programming....) by using a LSBM.
LSBM is integrated in the customization tools.
3 - Shop Loading
Check signature before loading within a computer. A LSBM must be used for this check.

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DIGITAL CERTIFICATES ALLOW TO SECURE FLS SUPPLIER DELIVERY UP TO A/C INSTALLATION

LOAD SECURE BATCH MEDIA (LSBM) IS USED TO SIGN AND CHECK THE FLS

FLS LOADING VIA USB KEY OR LRU INSTALLATION

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AIRCRAFT SECURITY AWARENESS

IMPORT SECURE DATA

Roles in Airlines:
- Certificated manager : Create customized data and sign load,
- Engineering Department : Collect, check and provide loads to mechanic,
- Mechanics : Install the secured load on board the A/C.

Technical features needed: Certificated, LSBM, USB key, smart card, card reader.
Procedures are defined in: MPM (AirNav) and recommendations are defined in Airbus Security Handbook.

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IMPORT SECURE DATA

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AIRCRAFT SECURITY AWARENESS

CABIN CREW WIRELESS SYSTEM

FUNCTIONAL NEEDS

The Cabin Crew Mobile Devices (CCMD) can be connected via wireless system to provide many applications such as Cabin Crew mails, Cabin Crew Operating manual, Cabin Log Book.
The Telemedicine enables the airline to send medical data and voice/video to the medical center on the ground.
In case of an emergency treatment, doctors on ground can use live video to remotely assist afflicted passengers onboard as well as the crew managing the emergency in the air.
These Cabin Crew Mobile Devices use digital signatures & certificates to secure all communications.
Cabin Crew Wireless System is an infrastructure system that manages the wireless from CCMD to the Cabin Operations Applications (COAs) and / or Telemedicine.

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CABIN CREW WIRELESS SYSTEM (CCWS) MANAGES THE WIRELESS ACCESS FROM CABIN CREW MOBILE DEVICES TO THE CABIN OPERATIONS APPLICATIONS (COAS) AND / OR TELEMEDICINE

COAS OFFER THE FOLLOWING FUNCTIONS:

- SEND / RECEIVE MESSAGES & FORMS TO / FROM AIRLINE NETWORK
- DISPLAY CABIN CREW MANUAL

COAS FUNCTIONS ARE ACCESSIBLE BY :

- CABIN CREW THROUGH THE FAP
- CABIN CREW MOBILE DEVICES
(UPON INSTALLATION OF THE CCWS)

CABIN CREW WIRELESS SYSTEM - FUNCTIONAL NEEDS

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AIRCRAFT SECURITY AWARENESS

CABIN CREW WIRELESS SYSTEM (continued)

SECURITY MEASURES

Airlines IT departments need to ensure:
- Cabin Crew Mobile Devices (CCMD) are hardened according to Security best practices:
- No Viruses,
- Security patches (System is up-to-date),
- Virus Scanner, Firewall...
- Certificate Management of CCMD:
- Devices that are authorized to connect to the aircraft need to be equipped with digital certificate.

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AIRLINES IT DEPARTMENTS NEED TO ENSURE:

- CABIN CREW MOBILE DEVICES (CCMD) SECURITY PRACTICES:
  - NO VIRUS
  - SECURITY PATCHES
  - VIRUS SCANNER, FIREWALL...

CERTIFICATE MANAGEMENT OF CCMD:

- DEVICES NEED TO BE EQUIPPED WITH **DIGITAL CERTIFICATES**

CABIN CREW WIRELESS SYSTEM - SECURITY MEASURES

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AIRCRAFT SECURITY AWARENESS

CABIN CREW WIRELESS SYSTEM (continued)

CCWS SUMMARY

Roles in Airlines:
- Cabin Crew : Enter one Flight password in the Cabin Crew Mobile Devices,
- IT Department : Install certificated on each Cabin Crew Mobile Devices.

Technical features needed: Certificated on each Cabin Crew Mobile Devices.
Procedures are defined in: Security Handbook.

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CABIN CREW WIRELESS SYSTEM - CCWS SUMMARY

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AIRCRAFT SECURITY AWARENESS

FAP (FLIGHT ATTENDANT PANEL)

The FAP belongs to the Cabin Intercommunication Data System (CIDS) and it is the main Human Machin Interface (HMI) for this system.
The FAP is directly connected to the Avionics World.
To ensure integrity and authenticity of data loading with OBRM, before CIDS data loading is performed, the seal on the OBRM shall be checked. If the seal is broken, the OBRM has to be removed and a spare OBRM has to be used.
The tamper seals shall be placed on the OBRM right after delivery and after installation of an OBRM. An USB "Physical lock" is installed to secure USB plug. During commercial flights, there is a plastic cover that gives a physical protection to the 3 slots of the FAP. Several functions of the FAP have a PIN Code.

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THE FAP ON BOARD REPLACEABLE MODULE (OBRM) CARD SLOT MUST BE SEALED AND CHECKED BEFORE CIDS DATA LOADING

USB "PHYSICAL LOCK" INSTALLED TO SECURE USB PLUG

EXAMPLE OF TAMPER SEAL

PROTECTION COVER ON THE FAP DURING A/C OPERATION

FAP (FLIGHT ATTENDANT PANEL)

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AIRCRAFT SECURITY AWARENESS

EFB (ELECTRONIC FLIGHT BAG)

SYSTEM DESCRIPTION

EFB is an information system for flight deck crewmembers. It allows storing, updating, delivering, displaying, and/or computing digital data to support flight operations or duties.
EFB host platform is portable (i.e. laptop or iPad) or installed in the aircraft. On A350XWB, the 2 EFB laptops are class 2 laptops. They can be connected and disconnected to/from the A/C network. When EFB is connected to the docking station, the flight crew can show the EFB image on the On-board Information System (OIS) displays and control it from the CDS controls.
To comply with Aircraft security, customization of pre shared key into OSFC as well as in EFB must be done. These Pre-shared keys are generated by engineering department or EFB office and will allow secure communications between EFB and Aircraft via OSFC.

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FOLLOWING MEASURES NEED TO BE IMPLEMENTED TO DEAL WITH ELECTRONIC FLIGHT BAG (EFB) SECURITY THREATS:

AIRLINE EFB ADMINISTRATOR MUST DEAL WITH:

- PRE-SHARED KEY UPDATE IN EFB LAPTOP
- SECURITY PATCH MANAGEMENT
- PREPARED LOAD CUSTOMISATION
- ANTIVIRUS
- LOGS RETRIEVE

ON A/C SIDE, EFB IS AUTHENTICATED (BASED ON PRE-SHARED KEY & PASSWORD), A/C CONTROL & DISPLAY ARE PROTECTED BY FIREWALL & SEGREGATION

EFB (ELECTRONIC FLIGHT BAG) - SYSTEM DESCRIPTION

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AIRCRAFT SECURITY AWARENESS

EFB (ELECTRONIC FLIGHT BAG) (continued)

EFB SUMMARY

Roles in Airlines:
- Flight Crew : Authentication (Login & PWD per pilot),
- Mechanic : Upload pre-shared key into OSFC,
- EFB Administrator : Antivirus, security patch management, logs retrieve, pre-shared key update in EFB laptop, prepared load customization.

Technical features needed: Pre-shared key to integrate into OSFC (customized load), Pre-shared key into EFB.
Procedures are defined in: Security Handbook for EFB management.

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EFB (ELECTRONIC FLIGHT BAG) - EFB SUMMARY

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AIRCRAFT SECURITY AWARENESS

PMAT (PORTABLE MAINTENANCE ACCESS TERMINAL)

SYSTEM DESCRIPTION

The maintenance crew uses the PMAT for connection to the On-board Information System (OIS):
- To get access to the maintenance applications,
- To do the maintenance operations on the A/C systems from different locations on the aircraft.

The PMAT can be connected to internal and external Ethernet connections strategically located through the A/C.
The connection between the OIS network and the PMAT plugs is done when the "COM GND CONNECTION" P/BSW is set to ON.
PMAT is firstly connected to get the security token from the OIS.
This token will enable it to be connected to the aircraft network.
Airline Engineering or IT department have to configure the PMATs to allow secure communications between PMAT and Aircraft via OSFC.

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SECURE USAGE AND ADMINISTRATION OF PMATS MUST BE ENSURED:

- ACCESS CONTROL (TO PROTECT A/C)
- PMAT INTEGRITY (TO PROTECT LAPTOP AND A/C)

ON A/C SIDE, PMAT SPECIFIC FIREWALL ON OIS TO PROTECT A/C SYSTEMS

PMAT NETWORK PORT LOCATION

1	AVIONIC RACK
2	REAR EBAY
3	FWD LDCC
4	STEERING DISCONNECT PANEL
5	REFUEL PANEL
6	CABIN 1 - DOOR 1
7	CABIN 2 - DOOR 3
10	AFT LDCC

MAINTENANCE PANEL

PMAT (PORTABLE MAINTENANCE ACCESS TERMINAL) - SYSTEM DESCRIPTION

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AIRCRAFT SECURITY AWARENESS

PMAT (PORTABLE MAINTENANCE ACCESS TERMINAL) (continued)

PMAT SUMMARY

Roles in Airlines:
- Mechanic : ICP Switch ON/OFF, retrieve security token from boot plugs (covered by AirNav procedure),
- PMAT Administrator : Administrate and manage PMAT (antivirus, security patch management, logs retrieve).

Technical features needed: No tool needed.
Procedures are defined in: AirNav procedure to start PMAT & Security Handbook for recommendations on PMAT protection.

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PMAT (PORTABLE MAINTENANCE ACCESS TERMINAL) - PMAT SUMMARY

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AIRCRAFT SECURITY AWARENESS

IFE (IN FLIGHT ENTERTAINMENT) SYSTEM

IFE is fully segregated from all A/C systems.
No data can be transmitted from IFE system into A/C systems.

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IFE (IN FLIGHT ENTERTAINMENT) SYSTEM

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AIRCRAFT SECURITY AWARENESS

ECAS (EMERGENCY CABIN ALERTING SYSTEM)

Emergency Cabin Alerting System (ECAS) includes hidden P/BSWs, which are installed at different locations in the cabin for the cabin crew. If the cabin crew pushes an ECAS P/BSW, some indications are triggered into the cockpit and cabin and the related cabin area is displayed automatically into the cockpit and on the FAP in the cabin. Video images come from Cockpit Door Surveillance System (CDSS) and Cabin Video Monitoring System (CVMS).
The CVMS and the CDSS have some cameras (for the CVMS, 10 to 20 cameras maximum in the cabin and for the CDSS, 3 to 4 cameras around the cockpit area).
The video images from CVMS and the CDSS can be displayed on the Cockpit Display System (CDS) in the cockpit for the flight crew or on the FAPs in the cabin for the cabin crew via manual selection.
The CDSS is automatically started if someone tries to go into the cockpit with the keypad of the CDLS or from the privacy door locking system.

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CONTEXT

- THE OPTIONAL **ECAS** FUNCTIONALITY:
  ALERT FLIGHT & CABIN CREW IN CASE OF EMERGENCY
- THE SIGNAL IS INITIATED BY NON-GUARDED P/B

MITIGATION

- THE ECAS SENDS A **DISCRET ALERT SIGNAL** TO COCKPIT (ECAM) AND CABIN DISPLAYS (AIP, ACP)
- THE ECAS CAN BE LINKED TO THE **CVMS**

ECAS (EMERGENCY CABIN ALERTING SYSTEM)

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AIRCRAFT SECURITY AWARENESS

SECURITY PUSH BUTTON SWITCHES - "KILL SWITCHES"

KILL SWITCHES

The "Kill switches" are used to cut communications between systems. These communications are restored by maintenance tasks.
These switches can be used in 2 different scenarios:
- Emergency & Threat Scenarios that can occur in cabin and/or cockpit area,
- Information Security Threat Scenarios (Data security incidents).
Emergency & Threats Scenario in Cabin and/or Cockpit:
- PAX INFO P/BSW is used to disable the display of some flight information to the passengers.
- LANDSCAPE CAMERA P/BSW is used to remove the display of all external Camera images within the cabin for passengers.
- MOBILE COM P/BSW is used to disable passengers' mobile phone within the cabin.
Information Security Scenario:
Specific functions are managed through OIS control panel on overhead panel. They are used by pilot to react if data security event is detected.
- CAB DATA TO OIS P/BSW stops the communication between the Passenger Services (IFE, Connectivity...) and the OIS.
- OIS DATA TO AVNCS P/BSW stops the communication between Aircraft Avionics systems and OIS.
- GATELINK P/BSW stops WACS to disable exchange via WIFI and cellular links (SATCOM & Wired connections remain available).
- COM GND CONNECTION allows & stops PMAT connections.
Some other "KILL SWITCH" is used to remove CVMS & CDSS & TACS display (in cockpit CDS, cabin passenger displays and FAP) of following video sources:
- External cameras (Landscape and Taxi Aid cameras),
- Cabin Video monitoring cameras,
- CDSS (Cockpit Door Surveillance System) cameras.
These switches can be installed in confidential location outside or inside the Aircraft (in the cabin or cockpit).

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CONTEXT

- Switches to disable video & communication functions
- Also called «Kill Switches»

SCENARIOS

- Emergency situation occurs in Cabin / Cockpit area
- Information security threat scenarios

AVAILABLE SWITCHES

HIJACK SCENARIOS

- PAX-INFO
- MOBILE COM
- LANDSCAPE CAMERA

- CVMS & CDSS TACS

INFORMATION SECURITY SCENARIOS

- COM GND CONNECTION

- OIS DATA TO AVNCS
- CAB DATA TO OIS
- GATELINK

- WLAN
- CONTROLLABLE SUNLIGHT SYSTEM

SECURITY PUSH BUTTON SWITCHES - "KILL SWITCHES" - KILL SWITCHES

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AIRCRAFT SECURITY AWARENESS

SECURITY PUSH BUTTON SWITCHES - "KILL SWITCHES" (continued)

DATA SWITCHES

Pushbutton switches for data security threat scenario:
- Aircraft Control Domain (ACD),
- Airline Information Services Domain (AISD),
- Passenger Info & Entertainment Services Domain (PIESD),
- Passenger-Owned Devices Domain (PODD).

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SECURITY PUSH BUTTON SWITCHES - "KILL SWITCHES" - DATA SWITCHES

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AIRCRAFT SECURITY AWARENESS

IN-SERVICE SECURITY MANAGEMENT

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A350 XWB IT SECURITY GENERALITIES

IN-SERVICE SECURITY MANAGEMENT

IN-SERVICE SECURITY MANAGEMENT

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AIRCRAFT SECURITY AWARENESS

SECURITY HANDBOOK

SECURITY HANDBOOK: INTRODUCTION

Purpose:
- The Security Handbook is the "one-stop" guide for in-service security management of the aircraft.
- It is a record of Aircraft Security-related:
- Assumptions,
- Instructions,
- Recommendations.

Primary audience:
- Aircraft security stakeholders of all A350, A380, A320 Family, and A330/A340.

As this document contains sensitive security information, we recommend a distribution in the aircraft operator's organization on a need-to-know basis only.

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PURPOSE

SECURITY HANDBOOK IS THE "ONE-STOP" GUIDE FOR IN-SERVICE SECURITY MANAGEMENT OF THE AIRCRAFT

IT IS A RECORD OF AIRCRAFT SECURITY-RELATED:

- → **ASSUMPTIONS**
- → **INSTRUCTIONS**
- → **RECOMMENDATIONS**

PRIMARY AUDIENCE

AIRCRAFT SECURITY STAKEHOLDERS OF ALL A350, A380, A320 FAMILY AND A330/A340

SECURITY HANDBOOK - SECURITY HANDBOOK: INTRODUCTION

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AIRCRAFT SECURITY AWARENESS

SECURITY HANDBOOK (continued)

SECURITY HANDBOOK: DESCRIPTION

Purpose:
- Single guide for in-service security management of the aircraft.
- Helps aircraft operators to organize themselves for Aircraft Security:
- Policies,
- Procedures,
- Roles and responsibilities.

Contains structured information :
- Assumptions,
- Instructions,
- Recommendations.

Covers several domains :
- Flight and Cabin Operation,
- Ground Administration and Maintenance Operation.

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PURPOSE

- SINGLE GUIDE
- HELPS A/C OPERATORS TO ORGANIZE:
  - POLICIES
  - PROCEDURES
  - ROLES AND RESPONSABILITIES

CONTAINS STRUCTURED INFO

- ASSUMPTIONS
- INSTRUCTIONS
- RECOMMENDATIONS

COVERS SEVERAL DOMAINS

- FLIGHT AND CABIN OPERATION
- GROUND ADMINISTRATION AND MAINTENANCE OPERATION

SECURITY HANDBOOK - SECURITY HANDBOOK: DESCRIPTION

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AIRCRAFT SECURITY AWARENESS

SECURITY INCIDENT MANAGEMENT - WORKFLOW

Detect & Report incident / Analyse & Prioritize / Incident Handling Support / Assess risks for whole fleet & other A/C Types / Initiate corrective actions / Implement & Monitor corrective actions.

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SECURITY INCIDENT MANAGEMENT - WORKFLOW

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AIRCRAFT SECURITY AWARENESS

AIRBUS AIRCRAFT SECURITY SITE

Airbus provides a dedicated site for the exchange of sensitive information related to A/C security.
Access is controlled via existing AirbusWorld accounts.
Access at :
https://w8.airbus.com/sites/product_security/sitepages/Welcome.aspx
In case of questions or changes: contact Airbus Security team via Tech Request.

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- **A DEDICATED SITE FOR THE EXCHANGE OF INFOS RELATED TO A/C SECURITY**
- **ACCESS IS CONTROLLED VIA EXISTING AIRBUS WORLD ACCOUNTS**
- **ACCESS AT: https://w8.airbus.com/sites/product_security/sitepages/Welcome.aspx**
- **QUESTIONS OR CHANGES: CONTACT AIRBUS SECURITY TEAM VIA TECH REQUEST**

AIRBUS AIRCRAFT SECURITY SITE

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AIRCRAFT SECURITY AWARENESS

KEY ROLE: AIRCRAFT SECURITY FOCAL POINT (ASFP)

ASFP tasks:
- Receive and manage cascading of the Security Handbook and Security Information Bulletins (SIB),
- Receive and manage sensitive information related to aircraft security (e.g. passwords and codes),
- Receive and manage information related to technical vulnerabilities,
- Receive, communicate, manage and report information related to security issues.

ASFP is also encouraged to:
- Coordinate and play an active part in the implementation of the requirements and recommendations from the Security Handbook,
- Participate in aircraft security related networking activities such as the Aircraft Security User Panel (ASUP) or information exchange between Aircraft Operators,
- Support in any activities related to an aircraft security incident.

The role of the ASFP may not be limited to one organization at the Aircraft Operator.
More than one ASFP may be nominated per Aircraft Operator.
Typical nominations:
- Engineering,
- Flight Operation,
- Corporate Risk Management,
- Safety and Security.

ASFP is not necessarily the same role as the Aircraft Operator Chief Security Officer as described in the ICAO Aviation Security Manual. Nevertheless, it is highly recommended that the ASFP has a close link to the Aircraft Operator Chief Security Officer.

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AIRCRAFT SECURITY FOCAL POINT (ASFP) TASKS & ROLES

SECURITY HANDBOOK

SECURITY INFORMATION BULLETINS (SIB)

SENSITIVE INFOS RELATED TO AIRCRAFT SECURITY

INFOS RELATED TO TECHNICAL VULNERABILITIES

COMMUNICATE, REPORT INFOS RELATED TO SECURITY ISSUES

IMPLEMENTATION OF THE REQUIREMENTS

AIRCRAFT SECURITY USER PANEL (ASUP)

SECURITY INCIDENT

- NOT LIMITED TO ONE ORGANIZATION
- MORE THAN ONE ASFP MAY BE NOMINATED PER AIRCRAFT OPERATOR
- TYPICAL NOMINATIONS:
  - ENGINEERING
  - FLIGHT OPERATION
  - CORPORATE RISK MANAGEMENT
  - SAFETY AND SECURITY

- NOT NECESSARILY THE SAME ROLE AS THE AIRCRAFT OPERATOR CHIEF SECURITY OFFICER (AOCSO) AS DESCRIBED IN ICAO AVIATION SECURITY MANUAL
- HIGHLY RECOMMENDED: ASFP HAS A CLOSE LINK TO THE AOCSO

KEY ROLE: AIRCRAFT SECURITY FOCAL POINT (ASFP)

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AIRCRAFT SECURITY AWARENESS

COMMUNICATING WITH AIRBUS SECURITY TEAM

For all communication with Airbus, use the Tech Request tool:
- Select Engineering domain,
- Select A/C Security topic.

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Tech Request

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