# Information Systems Presentation

GENERAL

● **Information Systems:**
- *ATIMS*
- *FSA*
- *ALNA*
- *Maintenance/test facilities functions*

The Information Systems include:
- the Air Traffic and Information Management System (ATIMS),
- the optional FlySmart with Airbus (FSA),
- the optional Airline Network Architecture (ALNA),
- and the maintenance/test facilities functions.

Note: The ALNA has many optional sub-systems. In this module, the ALNA is shown with all options.

INFORMATION SYSTEMS

Air Traffic and Information Management System (ATIMS)

FLY SMART WITH AIRBUS (FSA)

AIRLINE NETWORK ARCHITECTURE (ALNA)
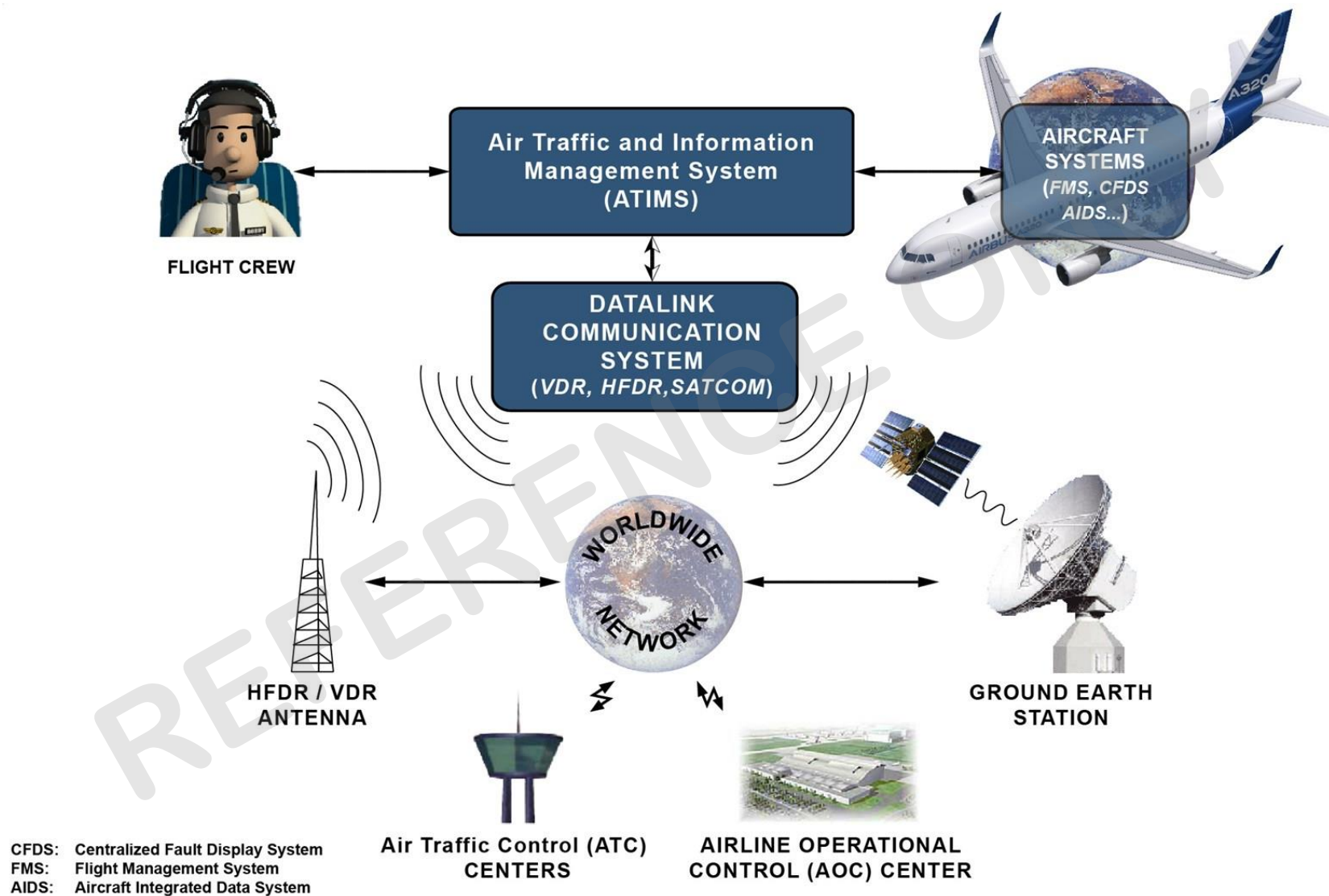
MAINTENANCE/TEST FACILITIES
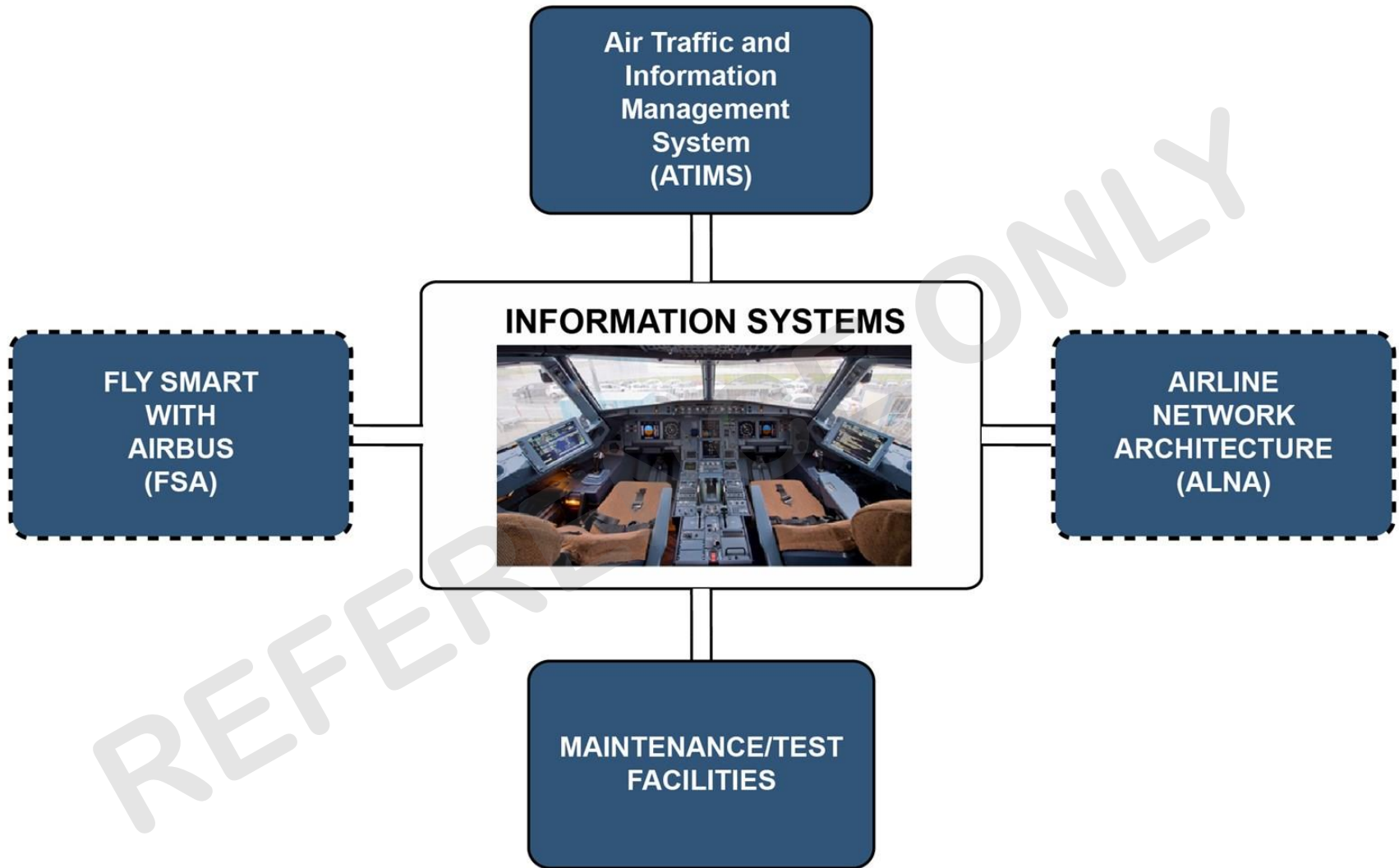
ATIMS

- **ATIMS system: For datalink communication between the A/C, the AOCs and the ATCs**
- **ATIMS system function: flight crew communication with ATC and AOC**
- **ATIMS system function: navigation & surveillance for ATCs**
- **Communication system: VDR, HFDR, SATCOM**

The Air Traffic and Information Management System (ATIMS) is used for data link communication between the aircraft, the Airline Operational Control (AOC) centers and the Air Traffic Control (ATC) centers.

The ATIMS system lets the flight crew communicate with the AOC centers and ATC centers.

The ATIMS sends the avionics systems parameters used for navigation and surveillance to the ATC systems.

The data link communication between the aircraft and the ground network is transmitted through the data link communication system, which includes the VHF Data Radio (VDR), HF Data Radio (HFDR) (if installed) and the SATCOM (if installed) systems.

Air Traffic and Information Management System (ATIMS)

FLIGHT CREW

AIRCRAFT SYSTEMS (*FMS, CFDS AIDS...*)

DATALINK COMMUNICATION SYSTEM (*VDR, HFDR, SATCOM*)

WORLDWIDE NETWORK

HFDR / VDR ANTENNA

GROUND EARTH STATION

Air Traffic Control (ATC) CENTERS

AIRLINE OPERATIONAL CONTROL (AOC) CENTER

CFDS: Centralized Fault Display System
FMS: Flight Management System
AIDS: Aircraft Integrated Data System

ARCHITECTURE

● **ATIMS component:**
- ***1 ATSU***
● **ATIMS HMIs**
- ***ATC message P/Bs***
- ***Loudspeakers***
- ***MCDUs***
- ***DCDUs***
- ***Printer***

The Air Traffic and Information Management System (ATIMS) operates
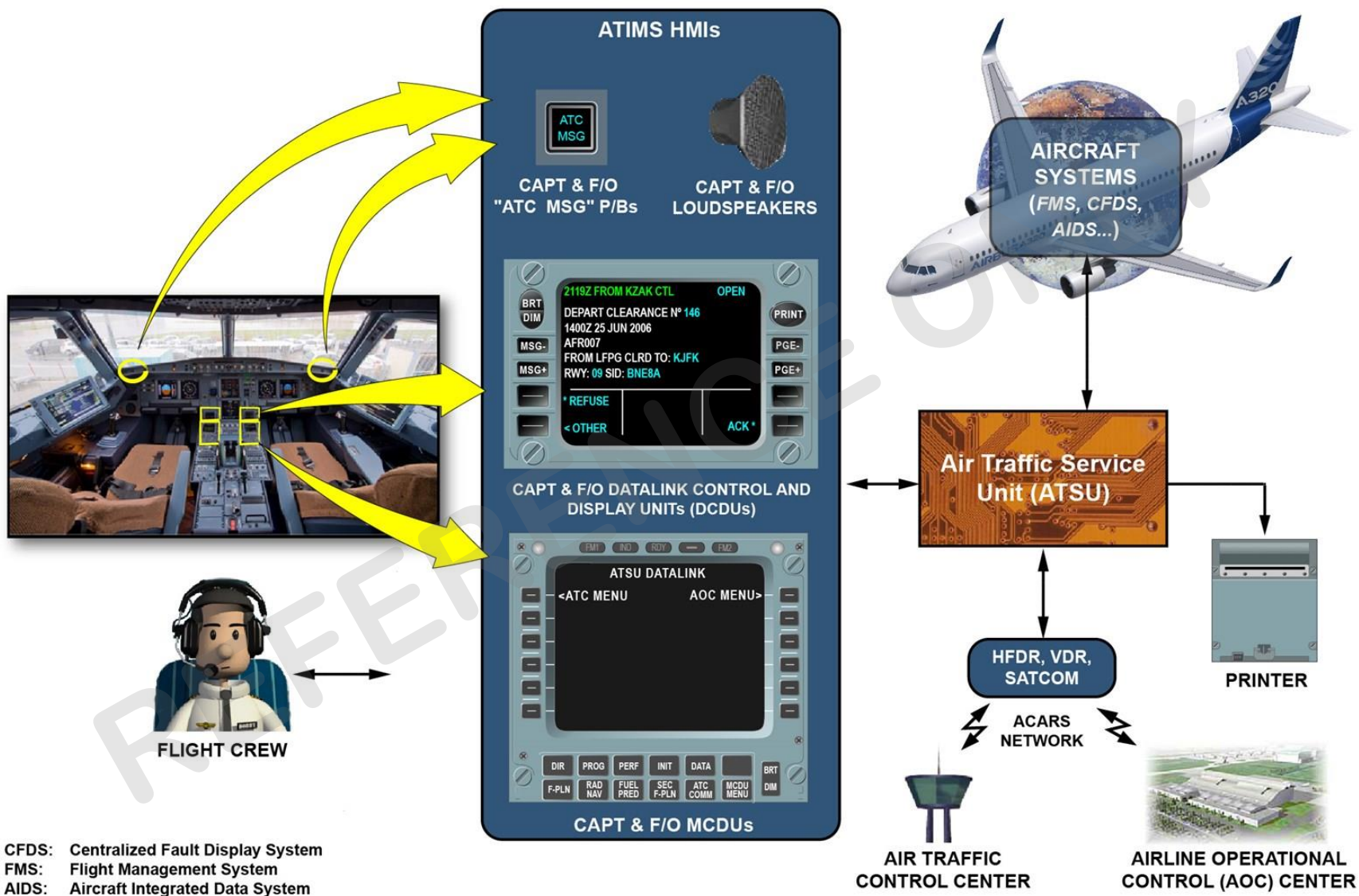through an Air Traffic Service Unit (ATSU).
This ATSU exchanges data with:
- A/C systems (aircraft parameters),
- the Printer,
- the ATC and AOC centers through the VDR, HFDR (if installed) and
SATCOM (if installed) communication systems,
- and the flight crew through different Human-Machine Interfaces (HMIs).
These interfaces are:
- the CAPT, F/O "ATC MSG" P/Bs and loudspeakers that tell that an ATC
message is received,
- the CAPT, F/O MCDUs and Datalink Control and Display Units (DCDUs)
that are used to type, file or manage messages. The DCDUs are for ATC
messages only.

Note: The DCDUs for ATC message communication are only installed if the
A/C is using FANS (Future Air Navigation System) configuration.

ATIMS HMIs

CAPT & F/O
"ATC MSG" P/Bs

CAPT & F/O
LOUDSPEAKERS

ATC MSG

2119Z FROM KZAK CTL   OPEN

DEPART CLEARANCE N° 146
1400Z 25 JUN 2006
AFR007
FROM LFPG CLRD TO: KJFK
RWY: 09 SID: BNE8A

* REFUSE

< OTHER   ACK *

BRT DIM   MSG-   MSG+   PRINT   PGE-   PGE+

CAPT & F/O DATALINK CONTROL AND
DISPLAY UNITs (DCDUs)

FM1   IND   RDY   —   FM2

ATSU DATALINK

<ATC MENU   AOC MENU>

DIR   PROG   PERF   INIT   DATA
F-PLN   RAD NAV   FUEL PRED   SEC F-PLN   ATC COMM   MCDU MENU   BRT DIM

CAPT & F/O MCDUs

FLIGHT CREW

AIRCRAFT
SYSTEMS
(*FMS, CFDS,
AIDS...*)

Air Traffic Service
Unit (ATSU)

PRINTER

HFDR, VDR,
SATCOM

ACARS
NETWORK

AIR TRAFFIC
CONTROL CENTER

AIRLINE OPERATIONAL
CONTROL (AOC) CENTER

CFDS: Centralized Fault Display System
FMS: Flight Management System
AIDS: Aircraft Integrated Data System

FLYSMART WITH AIRBUS (FSA)

● **FSA: supplies onboard electronic documentation/application for flight crew**
   - *Electronic Flight Bag (EFB)*
   - *Ops Library Browser to consult FCOM, MEL, CDL, AFM, CCOM, - - FCTM*
   - *Performance applications, aeronautical charts*

   - *A320 FSA does not offer maintenance electronic documentation or applications at the moment.*

FlySmart with Airbus (FSA) replaces paper documentation with onboard electronic documentation and applications.
FSA supplies the flight crew with an Electronic Flight Bag (EFB) that provides operational documentation like Flight Crew Operating Manual (FCOM), Minimum Equipment List (MEL), Configuration Deviation List (CDL), Airplane Flight Manual (AFM), Cabin Crew Operating Manual (CCOM), Flight Crew Training Manual (FCTM), performance applications, and aeronautical charts.
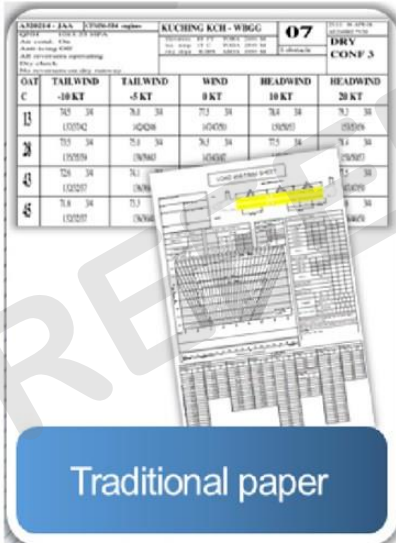
PILOT

Flight Bag

-*Airplane Flight Manuals,*
-*Performance information,*
-*Aeronautical charts*

PAPER

Traditional paper

FLYSMART WITH AIRBUS (FSA)

Electronic Flight Bag

ELECTRONIC
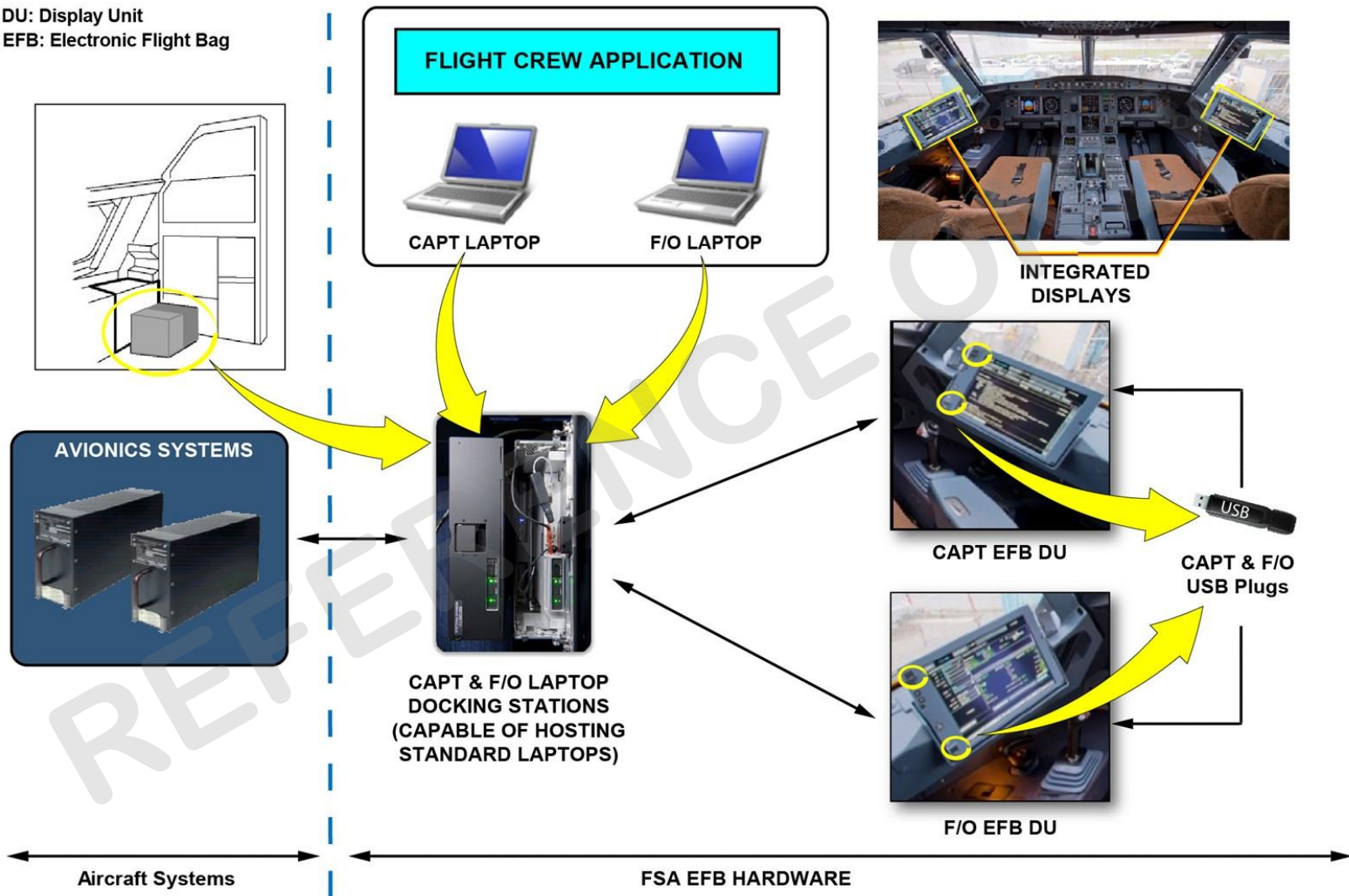
FlySmart with Airbus

ARCHITECTURE
● FSA EFB hardware:
      - CAPT & F/O Laptop Docking Stations connected to avionics systems
      - CAPT & F/O EFB DUs with USB plugs
      - CAPT & F/O portable airline laptops (not part of A/C definition)

The FSA architecture includes:
- the captain and first officer Laptop Docking Stations (LDS) which hosts the airline laptops, supplies electrical power to the laptops and provides an interface to several avionics systems,
- the captain and first officer touchscreen EFB Display Units (DU) which let the flight crew get access to and display the applications hosted by the laptops,
- the captain and first officer laptops, which hosts the Airbus EFB applications and airline selected application software.

Note: The laptops are portable devices proposed by Airbus or selected by the airline and matching with Airbus recommendation and are not part of the A/C definition. The laptops are usable by the pilots in and out of the aircraft.
The FSA also provides two USB plugs on the front face of each EFB Display Unit for data loading to the laptops.

DU: Display Unit
EFB: Electronic Flight Bag

FLIGHT CREW APPLICATION

CAPT LAPTOP   F/O LAPTOP

INTEGRATED DISPLAYS

AVIONICS SYSTEMS

CAPT EFB DU

USB

CAPT & F/O USB Plugs

CAPT & F/O LAPTOP DOCKING STATIONS (CAPABLE OF HOSTING STANDARD LAPTOPS)

F/O EFB DU

Aircraft Systems   FSA EFB HARDWARE

FLIGHT OPERATIONS APPLICATION
● *Access to Ops Library Browser, weather chart, navigation chart, and performance application via DU touchscreen*

From the touchscreen of the EFB Display Units, the flight crew can get access to flight operations applications, for example operational documentation, weather chart, navigation chart, and performance application.
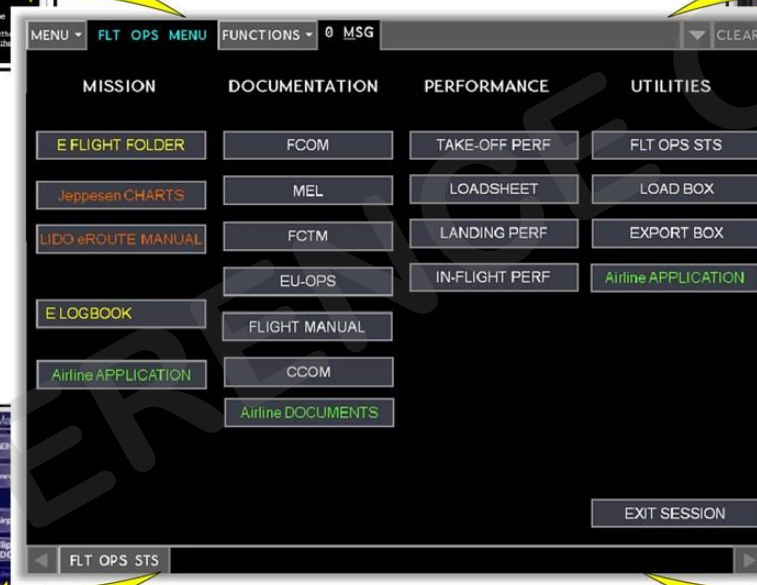
OPERATIONAL DOCUMENTATION

WEATHER CHART

Flight Operations Main Page

NAVIGATION CHARTS

PERFORMANCE APPLICATION

AIRLINE NETWORK ARCHITECTURE (ALNA)

● *ALNA only for PAX entertainment*
- *CINS for e-MAIL and Internet services*
- *OMTS for voice, SMS and data communication services*

The Airline Network Architecture (ALNA) is used only for PAX entertainment.
The ALNA includes:
- The Cabin Information Network System (CINS) for e-MAIL and Internet services,
- The Onboard Mobile Telephone System (OMTS) for voice, SMS and GPRS data communication services,

AirLine Network Architecture
(ALNA)

Cabin Information Network System (CINS)

ATA 46

PAX APPLICATION

E-MAIL
INTERNET

On board Mobile Telephone System (OMTS)

ATA 44

PAX COMMUNICATION

VOICE
SMS / DATA

+

ARCHITECTURE

● **CINS**

 - *HESU hosts the e-mail, internet and OMTS applications. The HESU is connected to some A/C systems, for example SATCOM, FDIMU, etc.*
 - *Optional CWLU for conversion of e-mail and internet data from Ethernet into Wi-Fi protocol toward the passengers and vice versa*
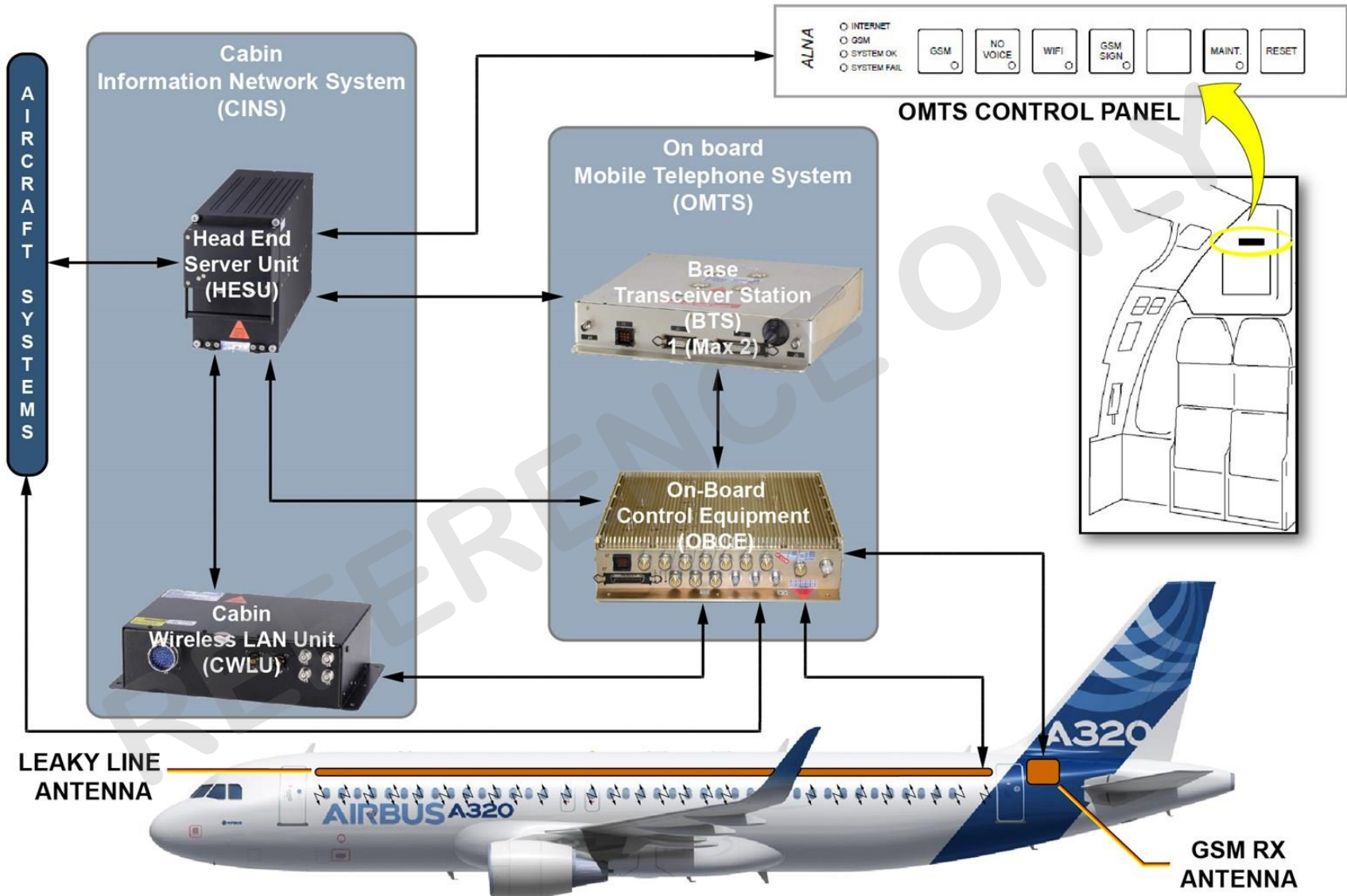
● **OMTS**

- *BTS (BTS 2 optional) supplies voice, GSM and GPRS services for mobile phones*
- *OBCE controls the radio frequency emissions of all mobile phones. OBCE hosts a noise generator which prevents the connection of mobile phones to terrestrial networks.*
- *Leaky line antenna for transmission to mobile phones and transmission/reception for Wi-Fi*
- *GSM antenna for reception of mobile phone signals*
- *OMTS CP to control ALNA and OMTS, and to show system status information*

The CINS includes:
- a Head End Server Unit (HESU) which hosts the e-mail, internet and on board mobile telephone system applications,
The HESU is connected to some aircraft systems, for example the Flight Data Interface Management Unit (FDIMU) to receive flight parameters and the SATCOM system to route GSM data between the On-Board Mobile Telephony System (OMTS) and SATCOM, etc...
- an optional Cabin Wireless LAN Unit (CWLU) for conversion of e-mail and internet data from Ethernet into Wi-Fi protocol for the passengers and vice versa.

The OMTS includes:
- a Base Transceiver Station (BTS), a second BTS can be installed as an option, which supply voice, GSM and GPRS services for mobile phones,
- an On Board Control Equipment (OBCE) which controls the radio frequency emissions of all mobile phones,
The OBCE hosts a noise generator which prevents the connection of mobile phones to terrestrial networks.
- a Leaky Line Antenna, for the transmission of radio signals to the mobile phones in the cabin, and transmission and reception for WiFi services,
The Leaky Line Antenna has a very uniform but low-field distribution in the cabin.
- a GSM Antenna, only for the reception of the GSM signals transmitted from mobile phones in the cabin,
- an OMTS control panel located above the Flight Attendant Panel (FAP), to control the ALNA system and OMTS and to show system status information.

MAINTENANCE/TEST FACILITIES

- **ATIMS BITE**
  - *- ATSU+DCDUs*
  - *- From MCDU*
- **FSA Maintenance supported by EFB Monitoring Page application on CAPT and F/O laptops**
- **ALNA BITE**
  - *- Concentrated by HESU*
  - *- Available from maintenance laptop (RJ45 plug on OMTS CP right hand side)*

The ATIMS BITE (ATSU+DCDUs) information and test request are available from MCDU through the Centralized Fault Display Interface Unit (CFDIU). The ATIMS maintenance menu is accessible using the "ATIMS" prompt from the INFO SYS SYSTEM REPORT/TEST page.
The maintenance operation of the FSA is supported by the EFB Monitoring Page application locally installed on the captain and first officer laptops.
The CINS and OMTS BITE data and test requests are transmitted to the HESU and are available through a maintenance laptop connected to the RJ45 plug installed on the side of the OMTS Control Panel. This maintenance laptop is supplied by the airline and obeys the AIRBUS specifications.

LMF: Local Maintenance Function

Air Traffic Information Management System (ATIMS)

DCDUs

Air Traffic Service Unit (ATSU)

FlySmart with Airbus (FSA)

LMF

CAPT LAPTOP

LMF

F/O LAPTOP

Airline Network Architecture (ALNA)

On board Mobile Telephone System (OMTS)

Cabin Network Information System (CINS)

CABIN PLUG

Maintenance Laptop

SYSTEM REPORT / TEST
INFO SYS
<ATIMS

<RETURN

MCDU

Centralized Fault Display Interface Unit (CFDIU)