

welcome



NANSC 2024

introduction

About

Aviation networks & AIS

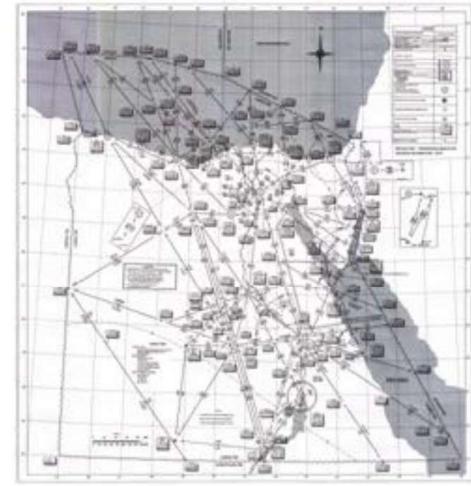
Instructor



Name: *Eng. Mohamed Sultan*
Position: System Engineer / Trainer
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Company: NANSC, Technical Building
Cargo Village Rd., Cairo, Egypt.

Air-Navigation Service

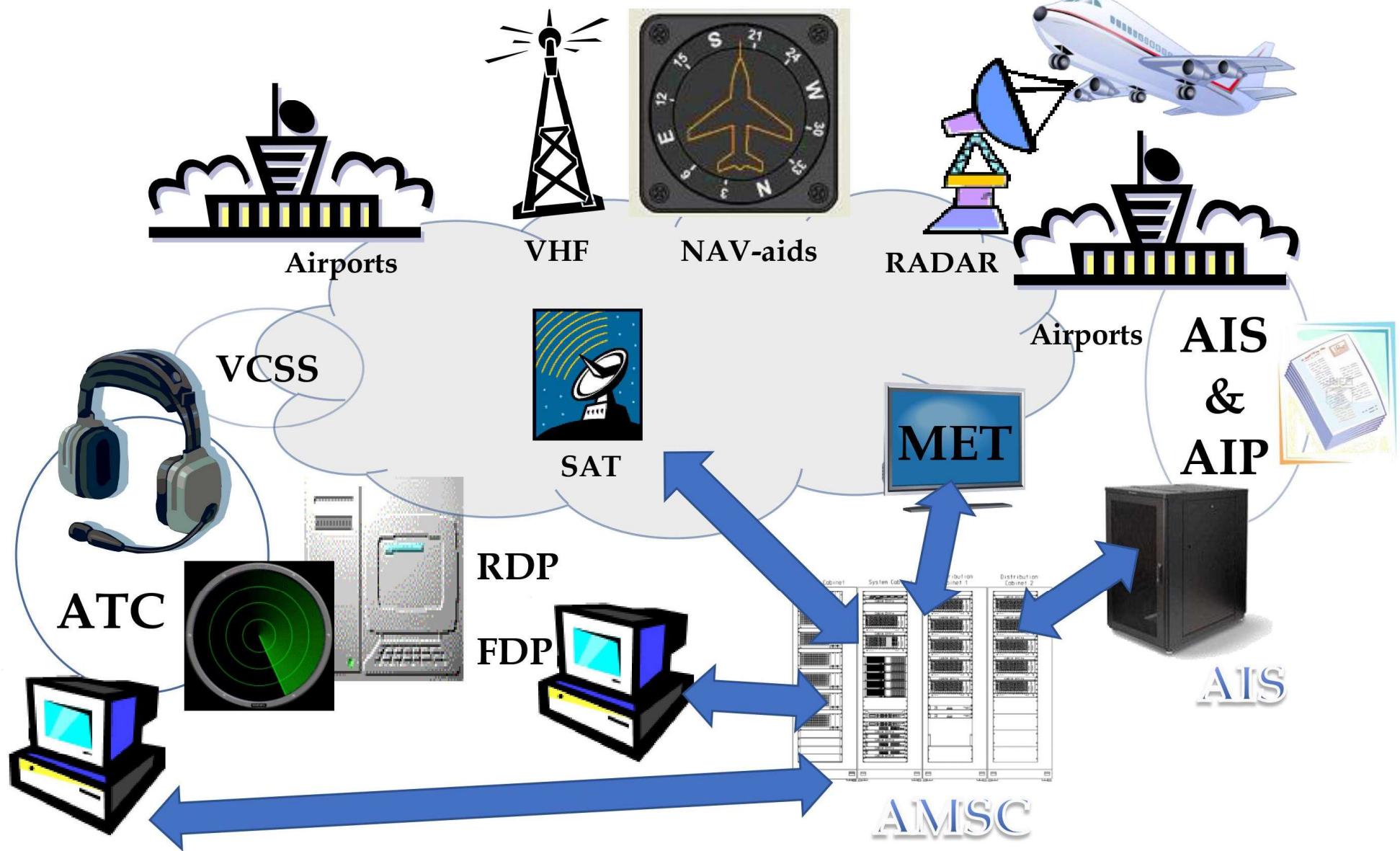
- [ANSP](#) Air Navigation Service Provider
 - is the organization that provides Navigational services to aircrafts in a dedicated block of airspace (FIR)
- [NANS](#) *{National Air Navigation service Company}*
is the authorized organization responsible for providing navigation service to all kind of flights in Egyptian FIR
- [CANC](#) *{Cairo Air navigation Center}*



Global Target

- Safety of air navigation

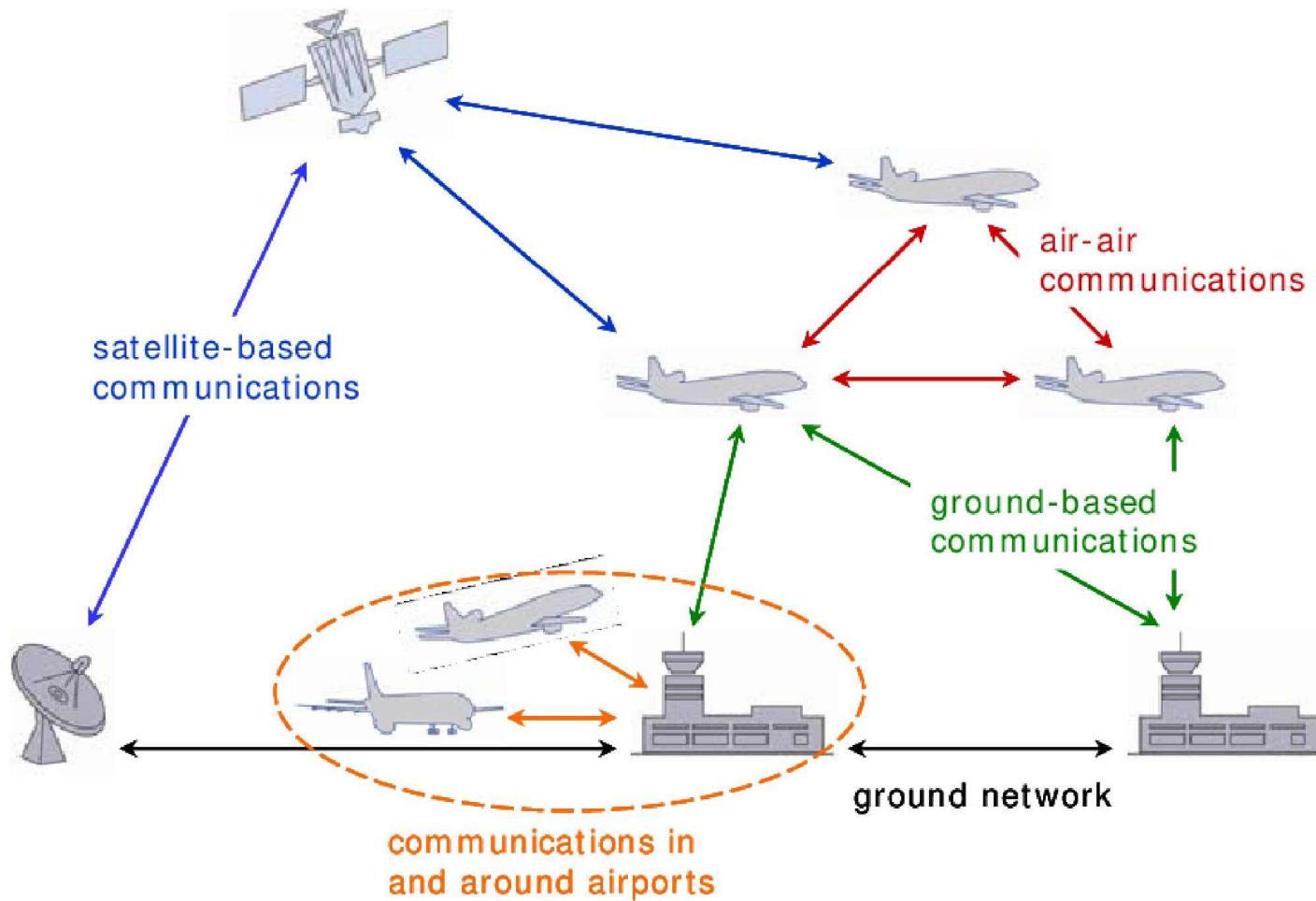
How ?



Aviation networks

- Aviation specific networks
- Types
 - Air-ground communication
 - Ground-ground Communication

Aviation networks



Aviation networks

- Air-ground communication networks
- Protocol
 - ACARS
- Examples
 - VDL / HFDL - SATCOM
- Service providers
 - SITA - ARINC

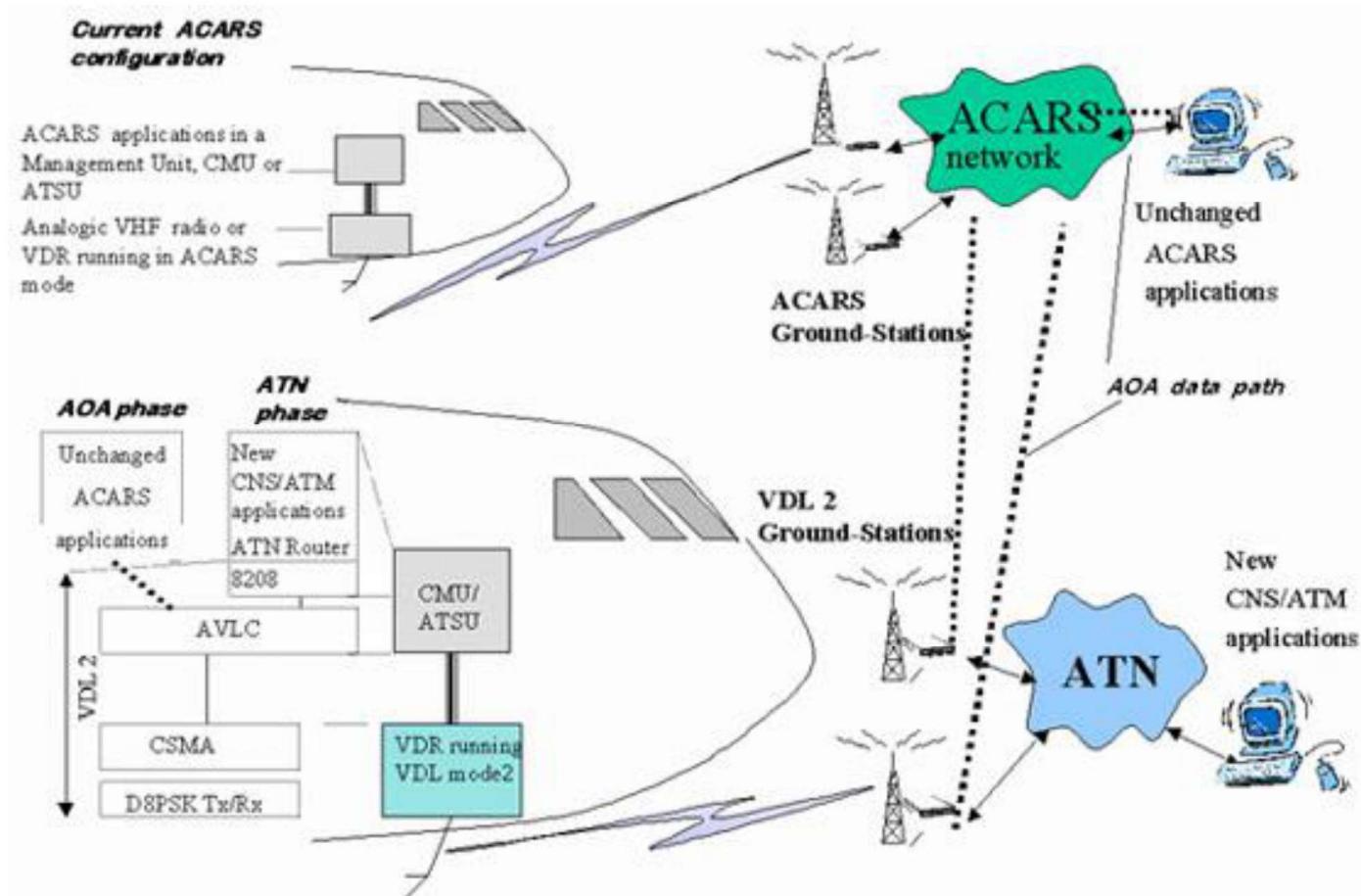
Air-ground communication

- ACARS
 - Aircraft
 - Communications,
 - Addressing and
 - Reporting System
- digital datalink system for transmission of short, simple messages between aircraft and ground stations



Air-ground communication

- ACARS



Air-ground communication

- ACARS

ACARS

ACARS Benefits to All Groups: Dispatch, Operations, Maintenance, Engineering, Catering, Customer Service, and Air Traffic Services



Air-ground communication

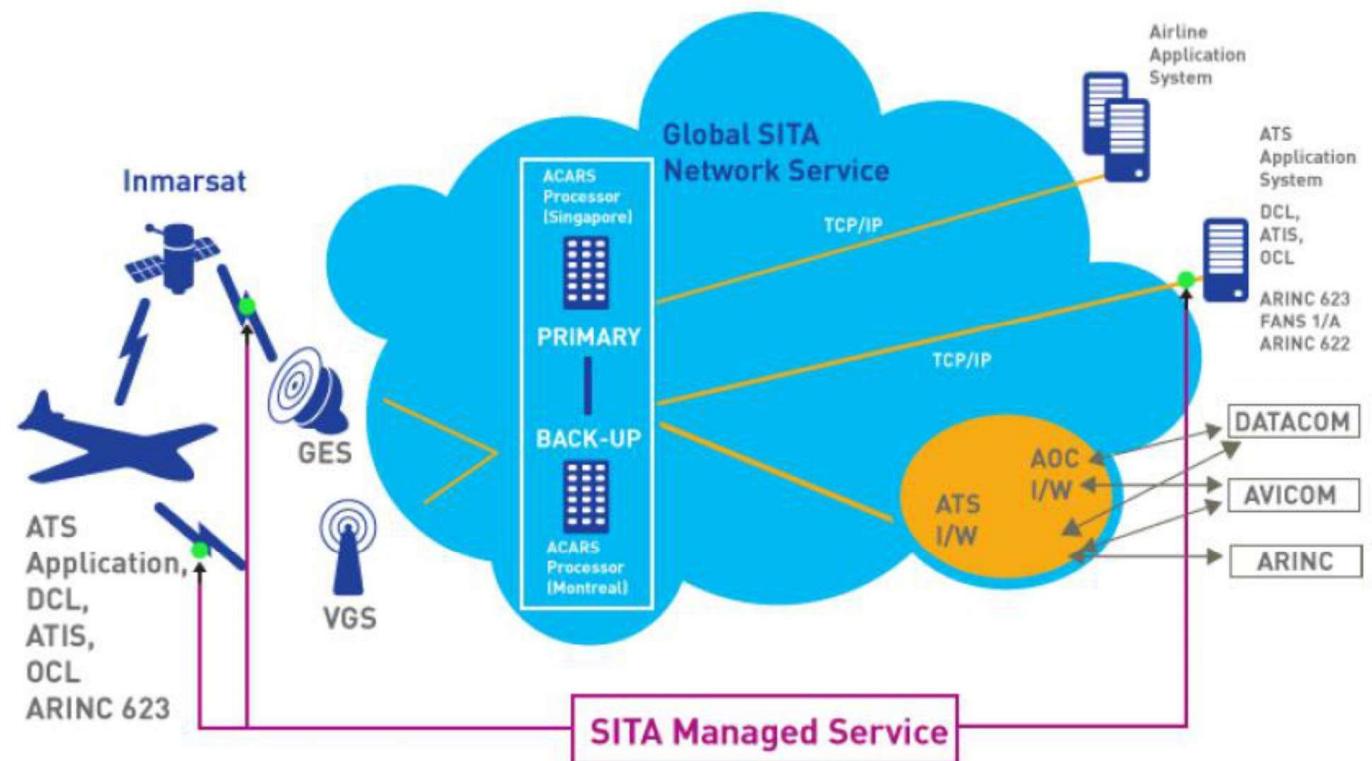
- VDL
- VHF Data Link
- Used in sending information between aircraft and ground stations

Air-ground communication

- Communication service providers:

- SITA

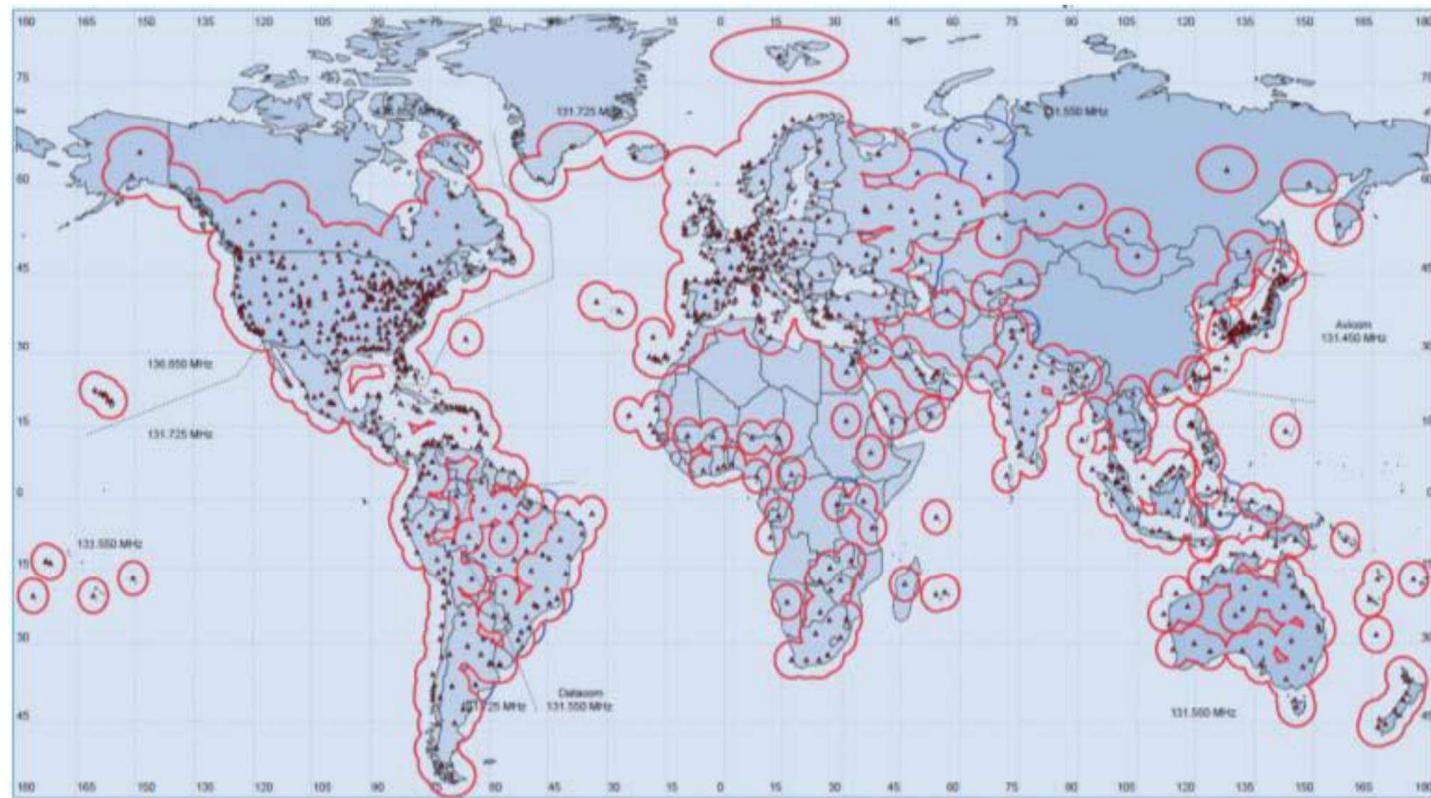
- ARINC



Air-ground communication

- **Communication service providers:**

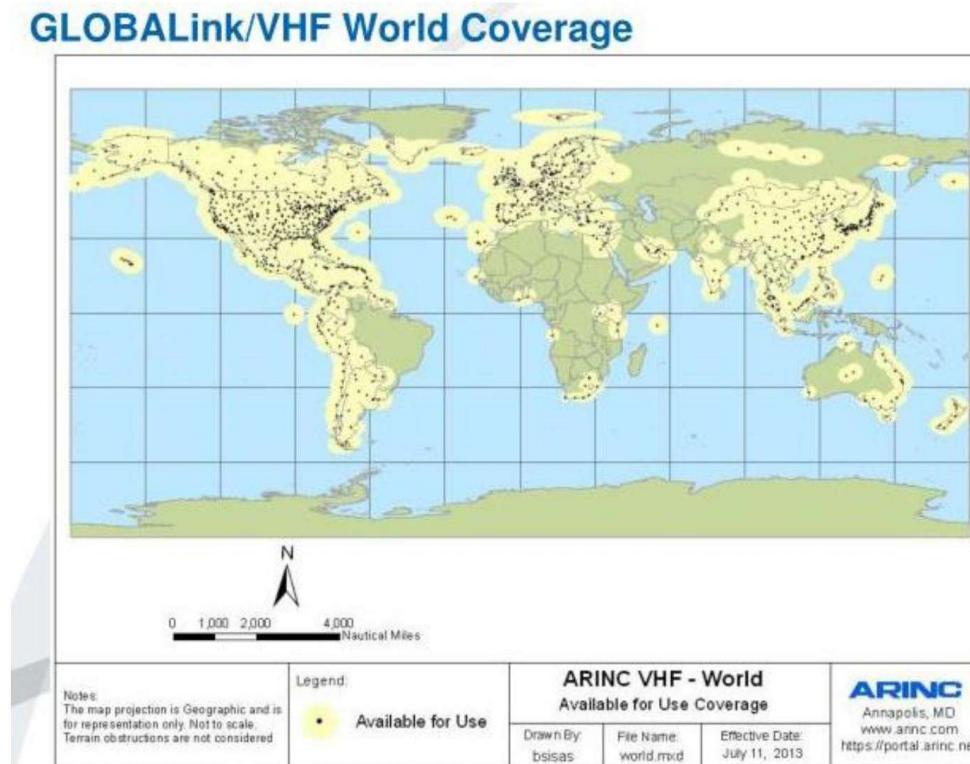
- SITA



Air-ground communication

- Communication service providers:

- ARINC



Aviation networks

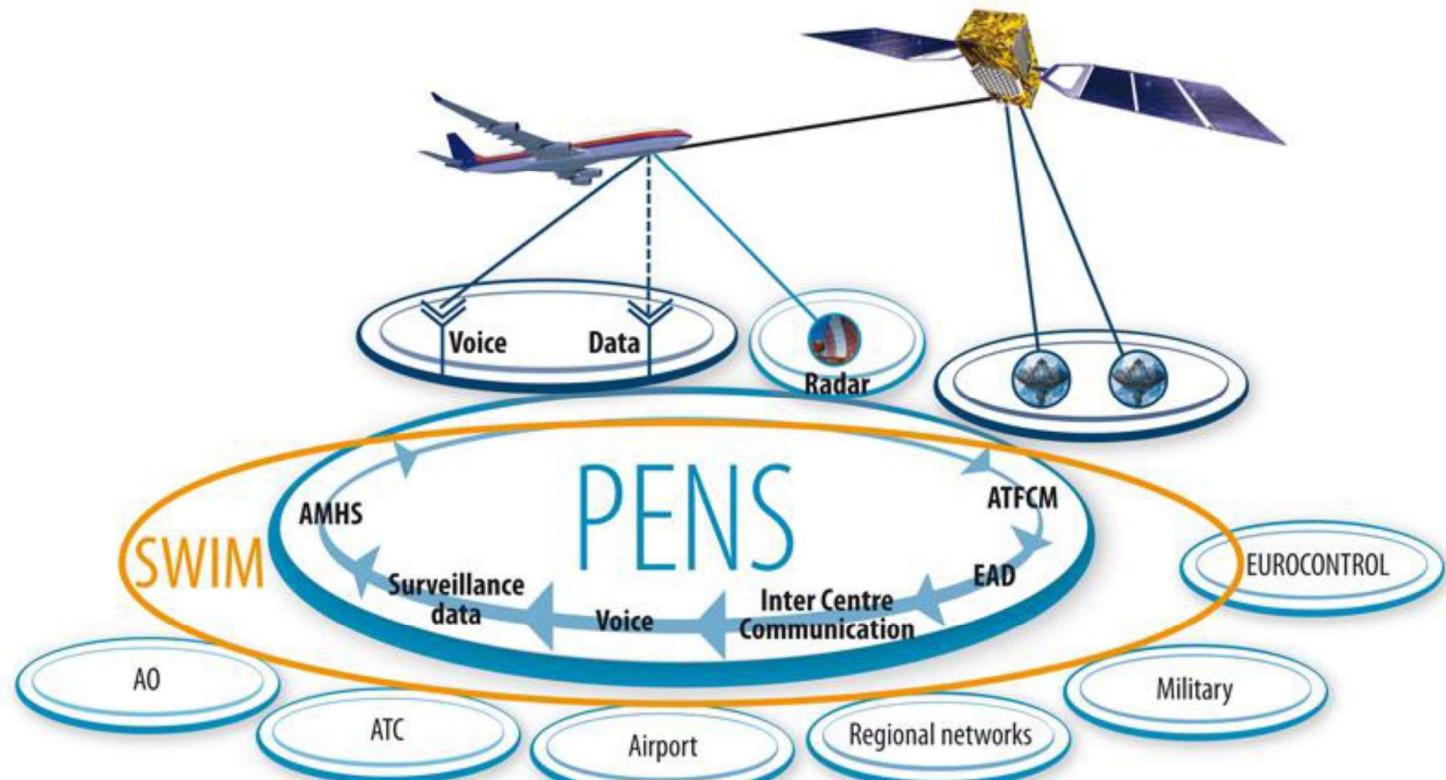
- Ground-ground communication networks
- Physical networks /Applications
 - AFTN/CIDIN – AMHS – AIDC – newPENS
- Communication Protocols
 - IP – X.25
- Service providers
 - SITA – ARINC – national Carriers – ANSPs

Ground-ground communication

- **newPENS**
 - international ground/ground communications infrastructure jointly implemented by EUROCONTROL and the European ANSPs in order to meet existing air traffic communication requirements.

Ground-ground communication

- PENS



Ground-ground communication

- PENS



Ground-ground communication

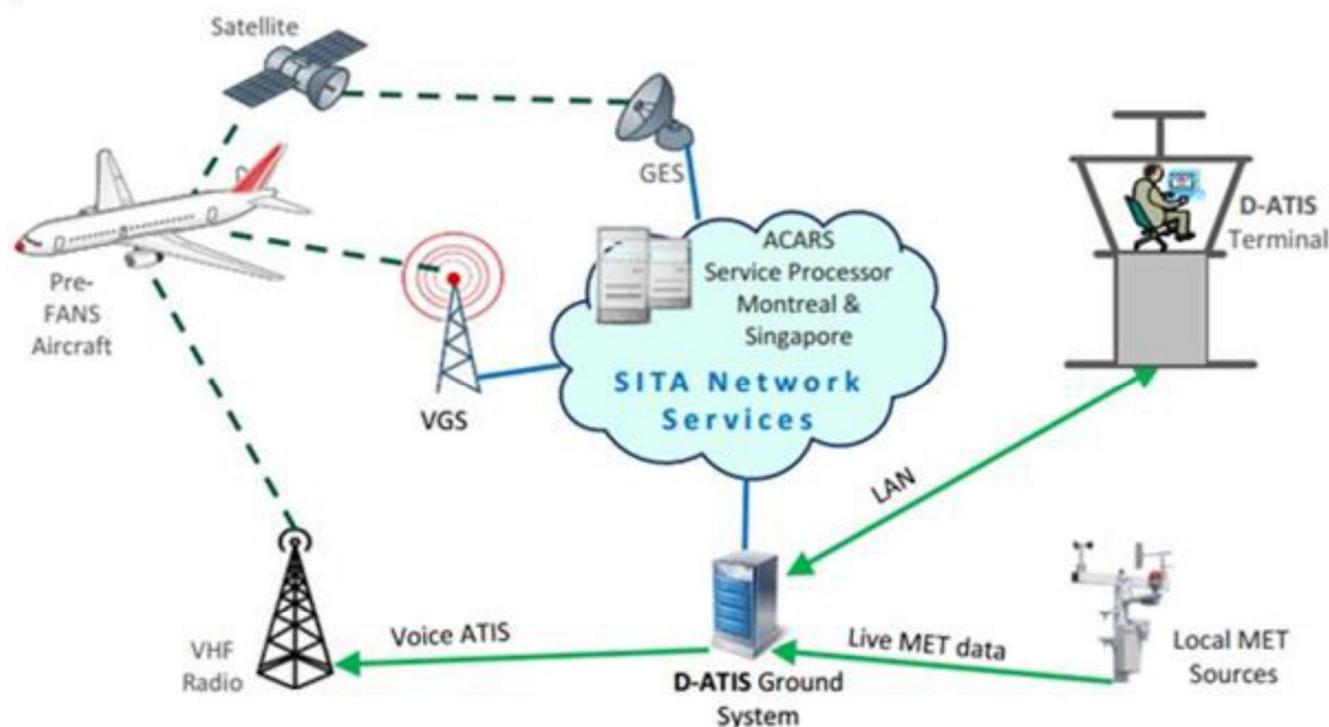
- Ground-ground communication networks
- Specific Protocols
 - MATIP (Mapping of Airline Traffic over Internet Protocol)
 - defined by RFC 2351
 - allows to receive and transmit airline reservation, ticketing, and messaging traffic over a Transmission Control Protocol/Internet Protocol (TCP/IP) network.

Ground-ground communication

- Ground-ground communication networks
- Specific Protocols
 - BATAP (Type B Application to Application Protocol.)
 - A protocol implemented between customer terminals and the SITA network to ensure end-to-end message protection.

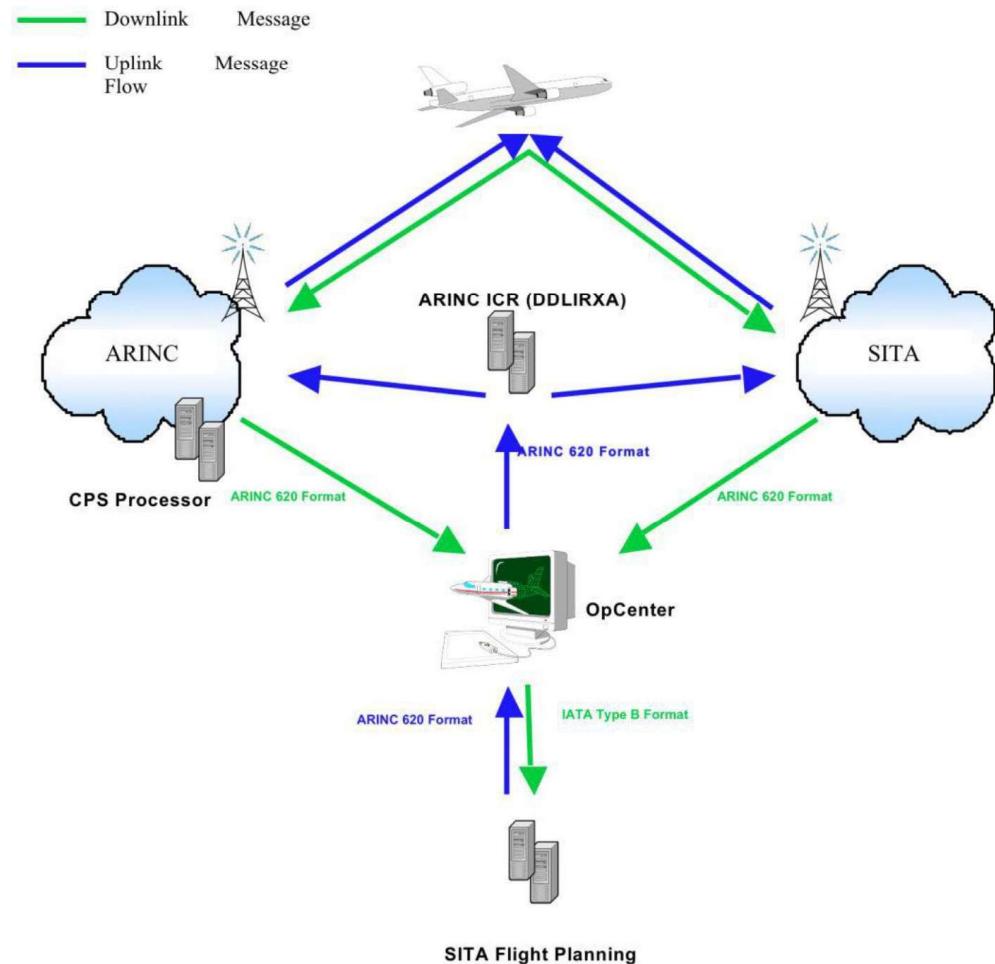
Ground-ground communication

- MATIP & D-ATIS



Ground-ground communication

- ARINC 620
 - DATALINK GROUND SYSTEMS STANDARD AND INTERFACE SPECIFICATION (DGSS/IS)

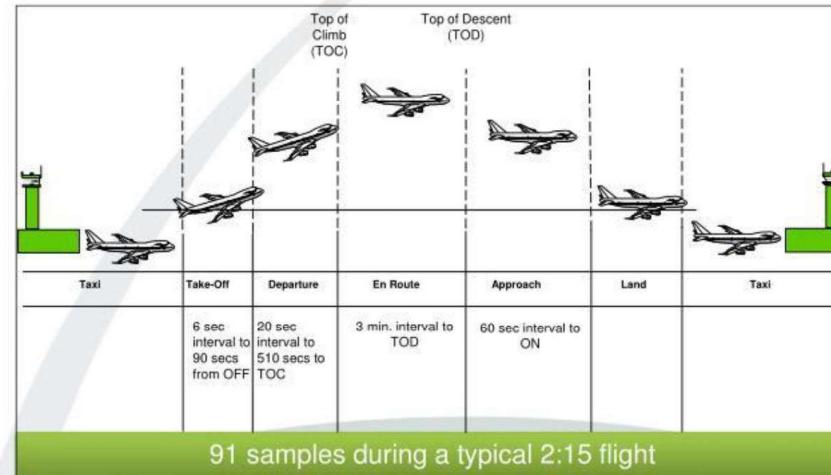


Ground-ground communication

ARINC 620

- defines the aircraft interfaces to the ACARS ground system.

Typical ARINC 620 Reporting



Aviation networks

- Networks on board of the Aircraft
- Specific Protocols
 - ARINC 429 (avionics data bus .)
 - defines the standard requirements for the transfer of digital data between avionics systems on commercial aircraft.

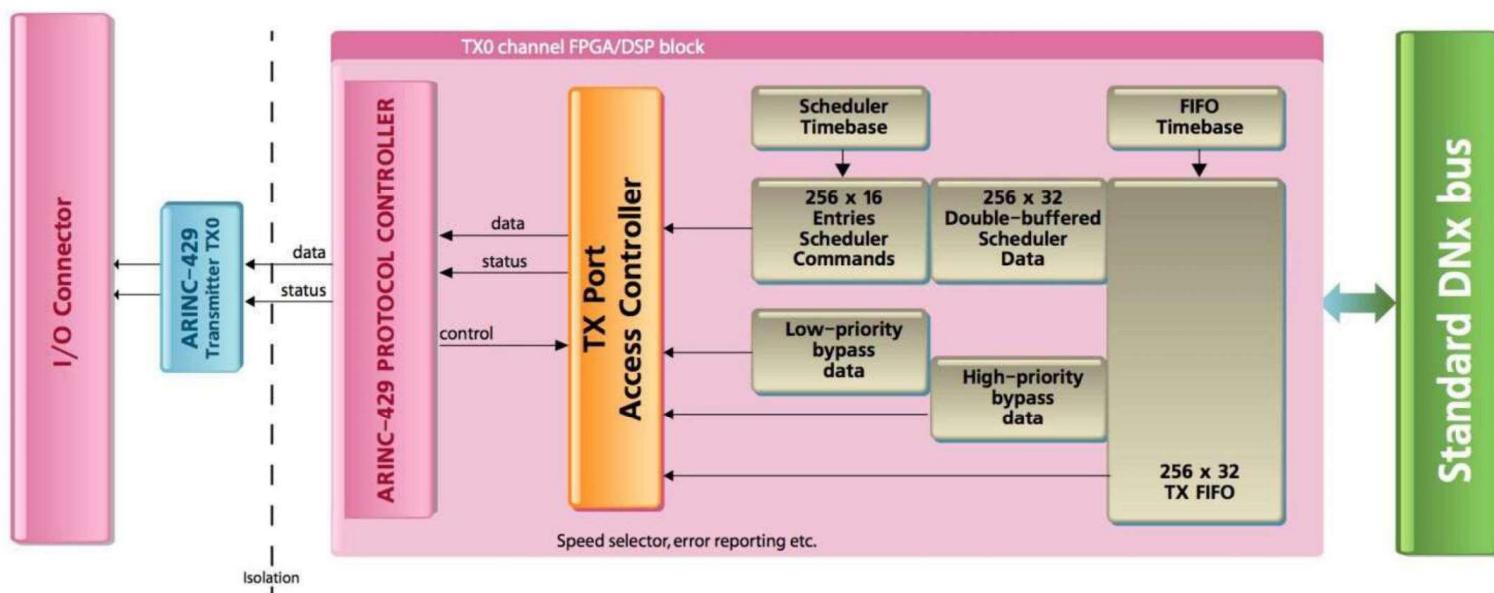
Networks on board of the Aircraft

- ARINC 429



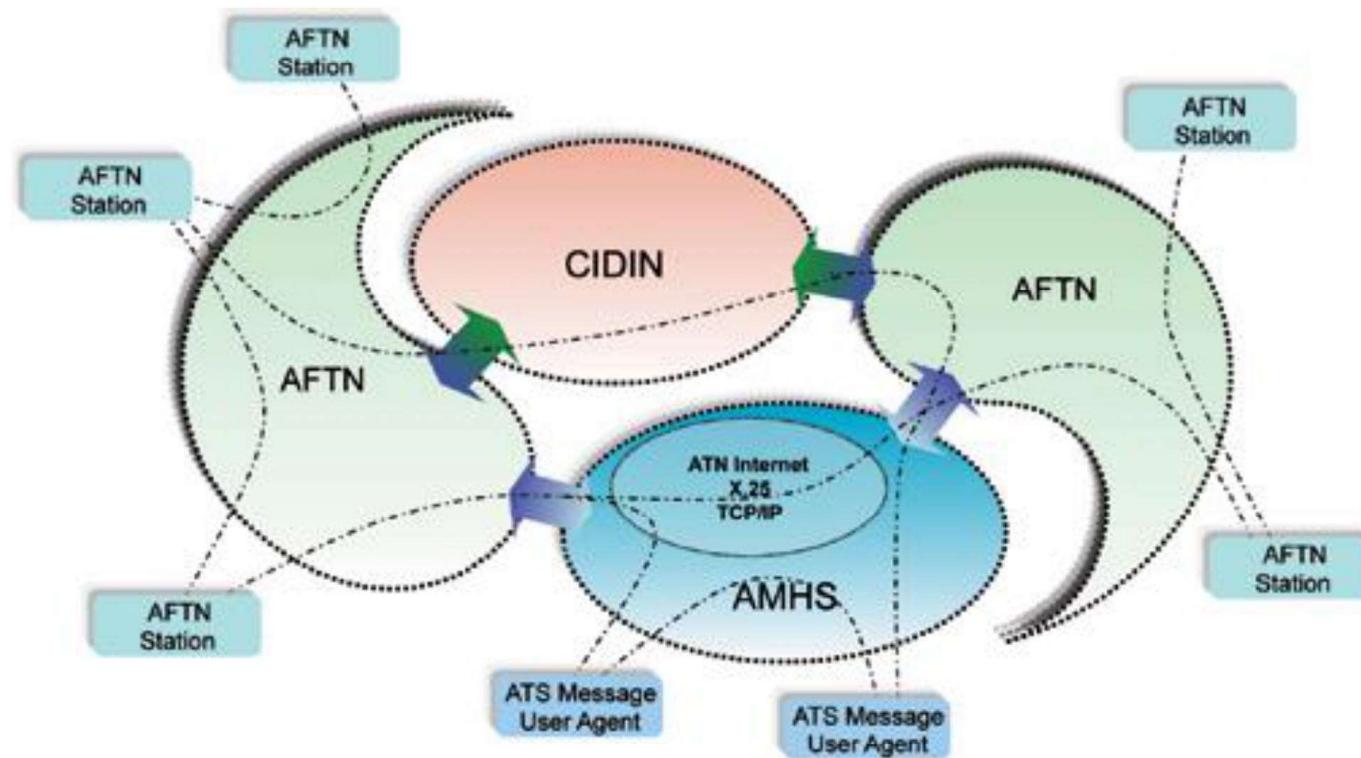
Networks on board of the Aircraft

- ARINC 429



Ground-ground communication

- AFTN
- CIDIN
- AMHS



AMSC

- Automatic Message Switching Center
- Main target
 - Management of aeronautical message transfer
 - Ensure connectivity of aeronautical circuits
 - Ensure the safety of aeronautical data

AMSC

- AMSC is located in Cairo navigation center CANC
- AMSC is Classified and certified by ICAO (International Civil Aviation Organization) as a main regional communication center in the middle east and Africa
- also as an entry point and exit point for the AFTN messages between Africa and Europe

AMSC

- Aeronautical Messages

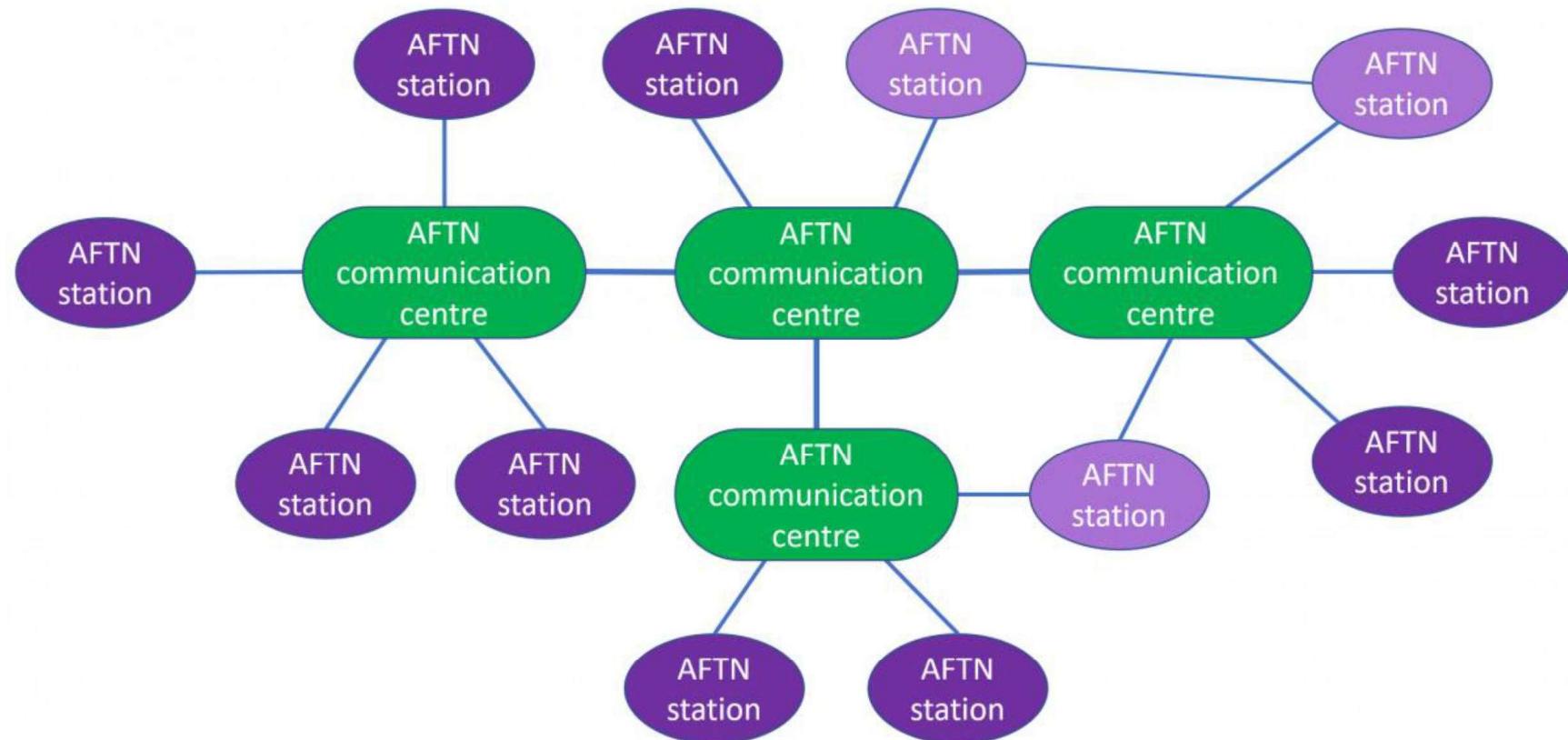
- Formatted container that contains :
 - Header (Src, Dst, creation, time, priority,)
 - Body (Aeronautical Data) can be:
 - Flight plan
 - Notam
 - Meteorological
 - SVCs
 - etc...

AMSC

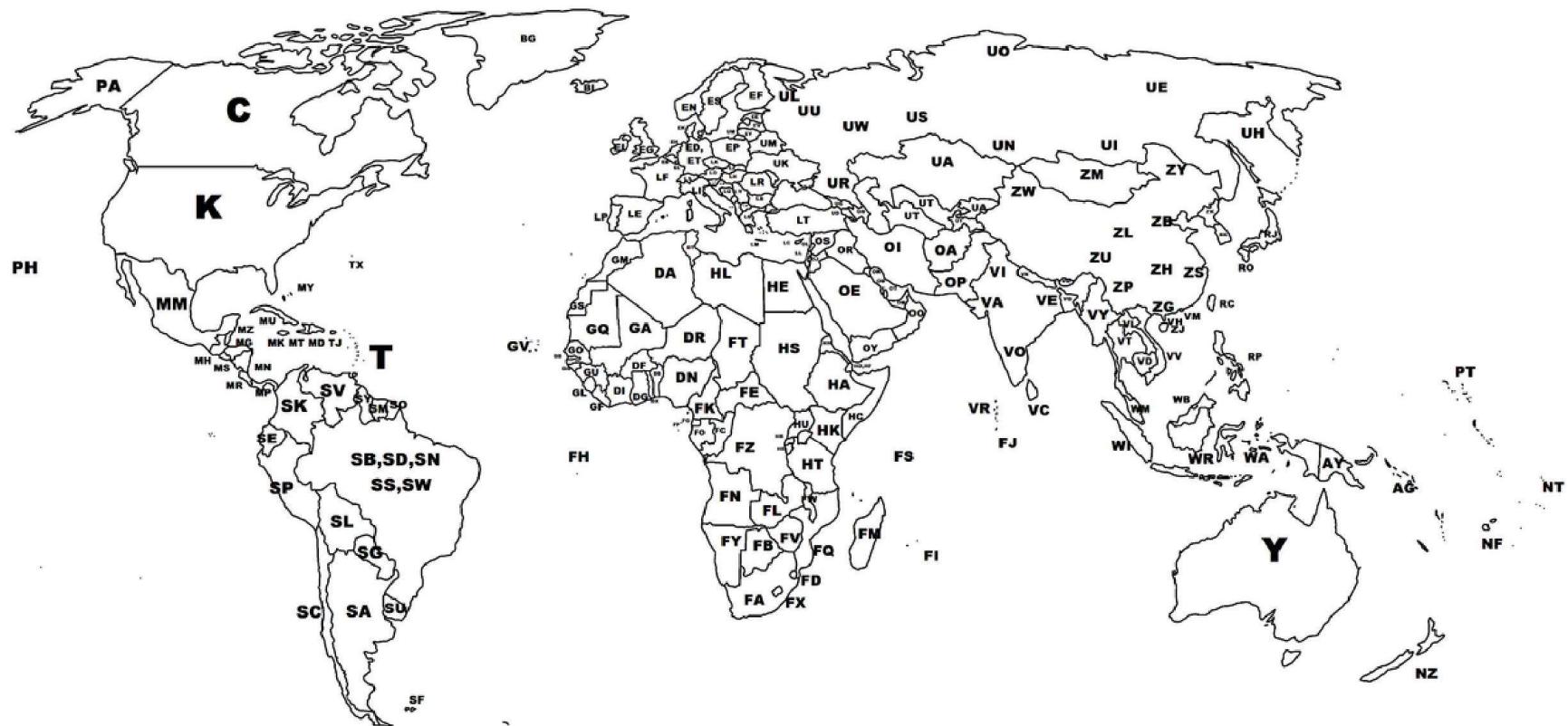
- **Protocol types**

- **AFTN** {Aeronautical Fixed Telecommunication Network}
 - fixed communication network for aviation purposes
- **CIDIN** {Common ICAO Data Interchange Network}
 - It's a protocol for more reliable and high speed transfer
- **AMHS** {Aeronautical Message Handling System}
 - exchange of messages over the ATN
 - Based on the X.400 standards of ISO

AFTN/CIDIN

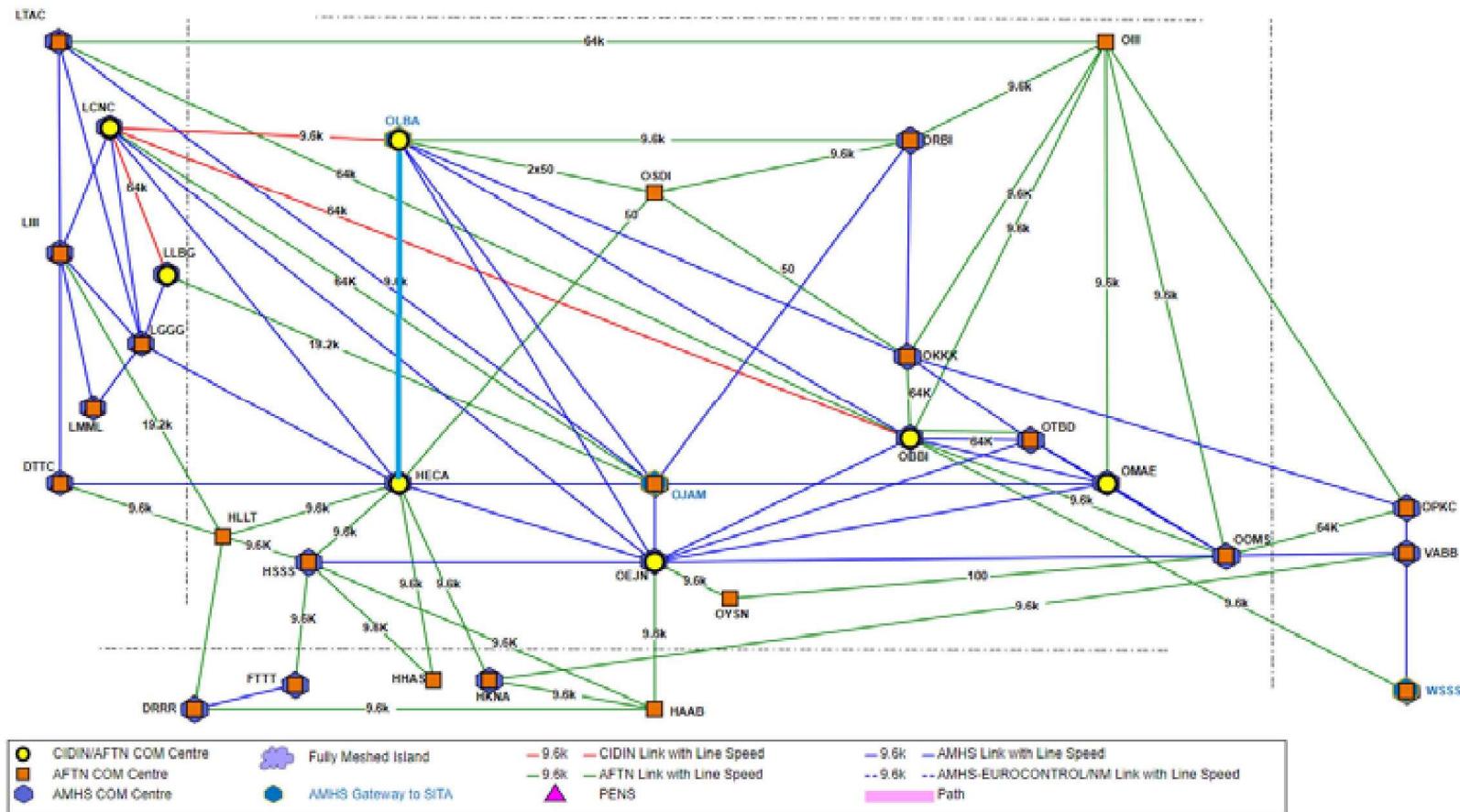


AFTN/CIDIN

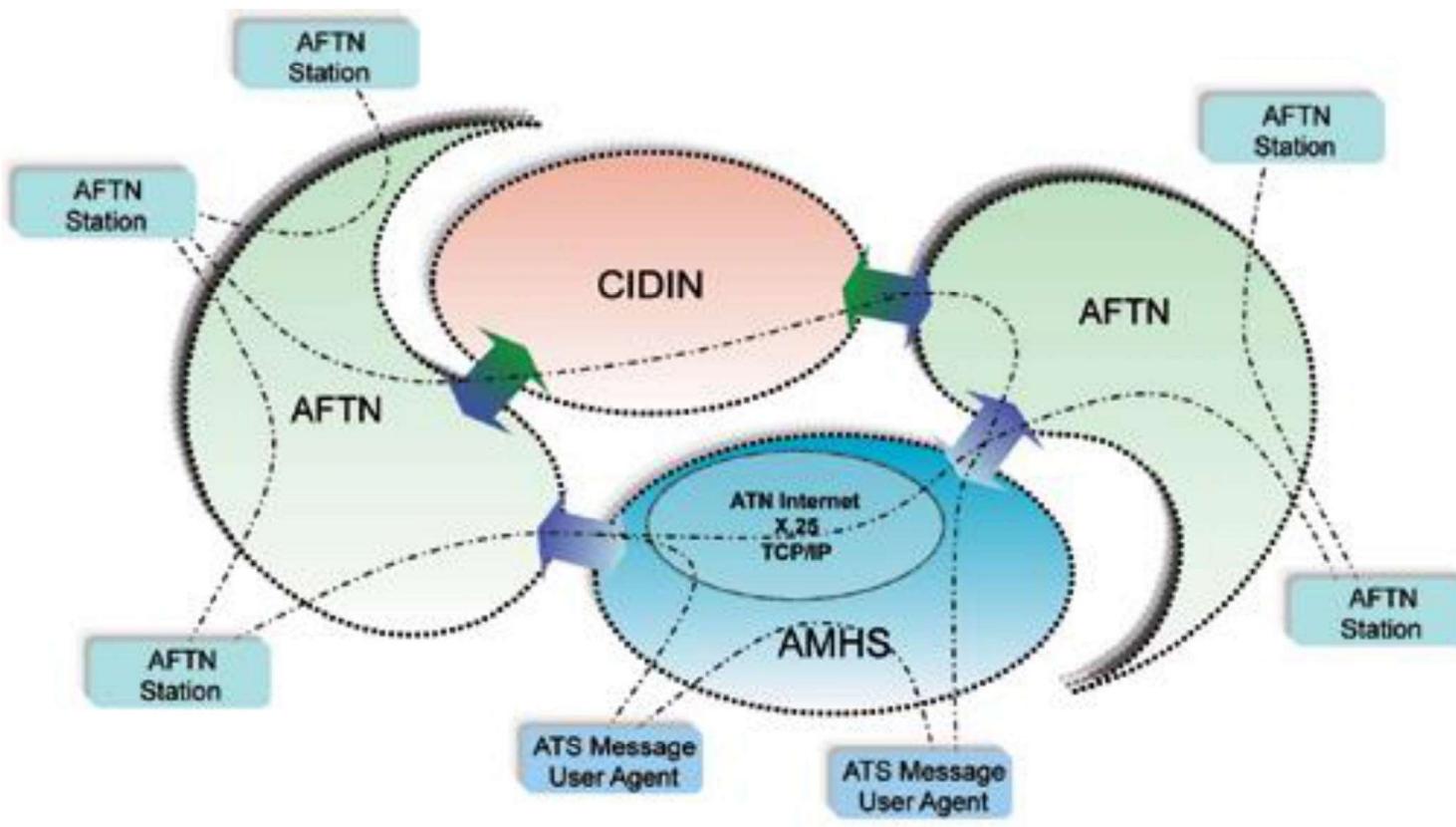


AFTN/CIDIN

MID COM Chart (25/04/2023)



AFTN/CIDIN



AIS

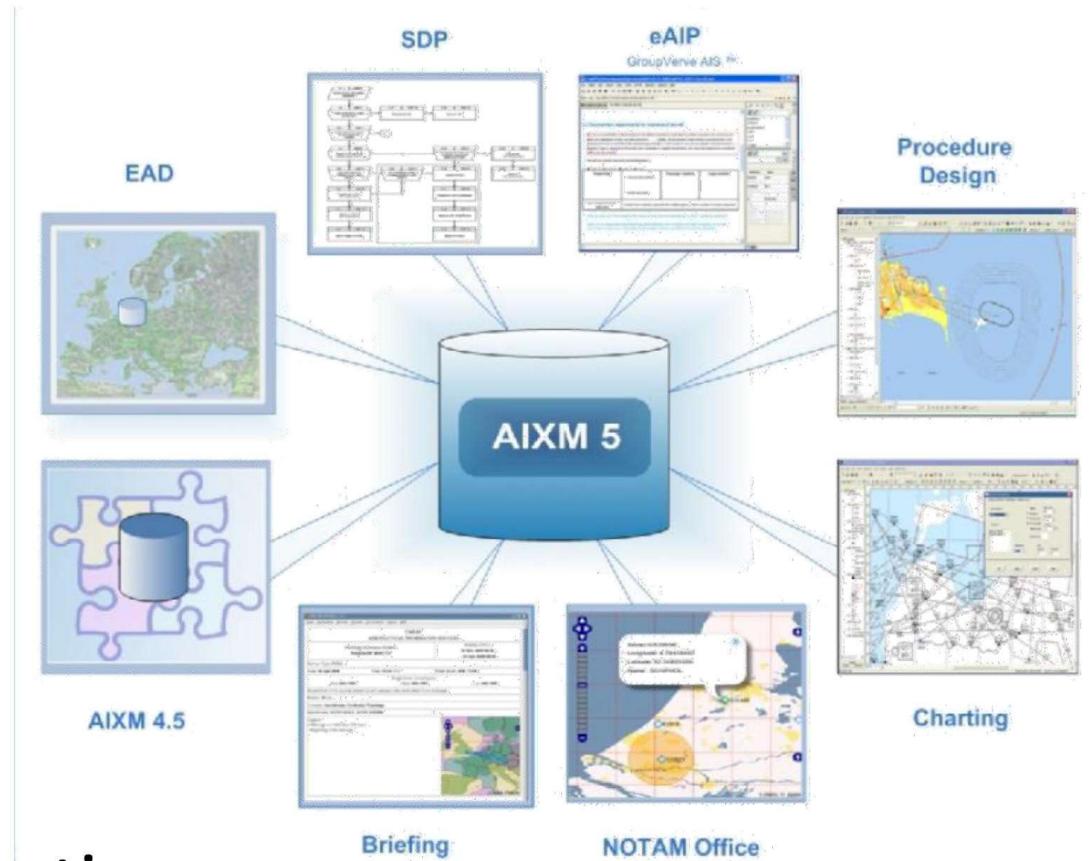
- Aeronautical Information Services/system
- a service that provides aeronautical information/data for
 - the safety,
 - regularity
 - and efficiency of air navigation

AIS

- Accurate, reliable and flexible aeronautical information is a vital component of modern air navigation.
- **Dynamic data**
 - impact flight planning and operations
- **Static data**
 - covering the location and character of navigation aids, the physical characteristics of airports and geography.

AIS

- Main target
 - Notam
 - Flight plans
- Aeronautical Charting
- AIP {Aeronautical Information Publication}



NOTAM

- Notice To Airmen

- issued by national authorities for some reasons:
 - Closed runways, taxiways, etc;
 - Unserviceable radio navigational aids;
 - Military exercises
- Flight Crew Access to current NOTAMS via *Airport Flight Briefing Facilities*

NOTAM

○ Notice To Airmen

W0004/24 NOTAMN

Q) HECC/QPIGV/IV/NBO/A/000/999/3006N03124E005 A) HECA B) 2401041254 C) 2401250001
E) AERODROME [US DOD E-IPL ONLY] VOR RWY 05C NOT AUTHORIZED

A0012/24 NOTAMN

Q) HECC/QMXLC/IV/BO/A/000/999/3007N03125E005
A) HECA B) 2401100700 C) 2401111500
D) DLY 0700-1500
E) TWY G PORTION BTN 60M AFT TWY G2 TILL RWY 23R AND TWY A PORTION BTN
60M AFT TWY J TILL TWY G CLSD DUE TO MAINT.

NOTAM

Notam List

TEL: 22678882 FAX: 22678882 AFS: HECAINYX	ARAB REPUBLIC OF EGYPT MINISTRY OF CIVIL AVIATION NATIONAL AIR NAVIGATION SERVICES COMPANY AERONAUTICAL INFORMATION SERVICES CAIRO INTERNATIONAL AIRPORT CAIRO 11776	NOTAM LIST 01 JAN 2024
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The following NOTAM were still in force on 01 JAN 2024 at 0025 NOTAM not included have been cancelled, time expired, superseded by AIP supplement or incorporated in the AIP.

Series (A) :2022/2023	0194 0144 0145 0188 0197 0223 0238 0239 0240 0247 0248 0260 0265 0271 0284 0285 0289 0290 0291 0293 0294 0295 0297 0298 0299 0300 0301 0302 0303 and 0304					
Series (B) :2014/2023	0018 and 0019					
Series (W) :2023	1332 1335 1336 1338 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 and 1353					
A0197/23	From 2309271525 to 2403272359EST, ATS RTE T55 portion BTN NABED/DEDLI changed to be as FLW: - Hours of OPS H24 - MNN INSTR FL FL300.	ATS RTE				
A0265/23	From 2311200900 to 2401202359EST, AWY W976 portion BTN SISIK/TAKSU MNN INSTR FL changed to be FL260 and AIP SUP 33/22 CNL.	MNN FL				
A0295/23	From 2401010001/PERM, the unit rates applicable from 1ST JAN 2024 are:- <table border="1"><tr><td>Route Services</td><td>21.39 EUR</td></tr><tr><td>Approach/Aerodrome control services</td><td>155.17 EUR</td></tr></table>	Route Services	21.39 EUR	Approach/Aerodrome control services	155.17 EUR	Unit Rates
Route Services	21.39 EUR					
Approach/Aerodrome control services	155.17 EUR					
	The rate of interest on late payment of air navigation charges is 13.26 percent per annum. AMD AIP accordingly.					
A0302/23	From 2312292210 to 2401312359EST, Khartoum FIR avoidance TFC avoiding Khartoum FIR shall RTE VIA DEDLI. Significant points NUBAR, ATMUL and ENABU are not AVBL EXC significant point ALEBA which is AVBL for TFC to FM HSPN AD as FLW for NB TFC FM HSPN AD to cross ALEBA at or ABV FL300 for SB TFC to HSPN AD to cross ALEBA at or ABV FL310 for NB TFC pilots shall assigned level and to contact Cairo ACC 10 MIN prior to reach ALEBA. State and humanitarian flights are exempted by PPR FM Egyptian CAA.	FIR avoidance				
A0304/23	From 2401010700 to 2401312200, JAN FM 01 to 04, FM 06 to 11, FM 13 to 16, FM 20 to 25 and FM 27 to 31 DLY FM 0700 to 2200, ATS RTE V604 portion BTN NOZ/DEGDI CLSD.	Closure				
W133/23	From 2401050410 to 2401241600, JAN 05 FM 08 to 11, FM 20 to 24 DLY FM 0410 to 1600, danger area D27 is active. GND /FL150.	Danger Area				
W134/23	From 2401040800 to 2401311000, JAN 04, 09, 11, 16, 18, 23 and 30 FM 0800 to 1100, danger area D24 is active. GND /FL050.	Danger Area				
W1345/23	From 2401010420 to 2401311600, JAN FM 01 to 04, 06, FM 09 to 11, 13, 14, FM 16 to 18, FM 20 to 24 and FM 27 to 31 DLY FM 0420 to 0645, FM 1300 to 1600, JAN 08 and 15 FM 0420 to 0645, MIL EXER WI area 301830N0313000E 302100N0313048E 302100N0313424E 301830N0313430E 301830N0313000E, Cairo TMA affected. GND /FL080.	MIL EXER				
W1346/23	From 2401030420 to 2401220900, JAN 03, 10 and 17 FM 0420 to 1100, JAN 08, 15 and 22 FM 0420 to 0900, danger area D23 is active. GND /FL480.	Danger area				
W1347/23	From 2401010800 to 2401312130, JAN 01, 02, 04, 06, 07, 09, 11, 13, 14, 16, FM 18 to 21 and FM 23 to 31 DLY FM 0600 to 2130, JAN 03, 10 and 17 FM 1100 to 2130 and JAN 08, 15 and 22 FM 0900 to 2130, MIL EXER will take place radius 5KM centre 293400N0305340E, Cairo TMA affected. TFC to FLW ATC Instructions. GND /FL120.	MIL EXER				
W1353/23	From 2401010700 to 2401312200, JAN FM 01 to 04, FM 06 to 11, FM 13 to 16, FM 20 to 25 and FM 27 to 31 DLY FM 0700 to 2200, MIL EXER WI area 315823N0294009E 321850N0300741E 312943N0305946E 303944N0311027E 303931N0305531E 312222N0301422E 312451N0300141E 315823N0294009E, Cairo TMA affected. FL100 /FL500.	MIL EXER				
	AD Al Alamein INTL (HEAL)					
A0297/23	From 2312241330/PERM, all Inbound TFC to HEAL AP shall ADD AF3 address HEBAZAZR to FPL ADD to AIP accordingly.					
	Awan INTL (HESN)					
A0290/23	From 2312072200 to 2312210330EST, DLY FM 2200 to 0330, mobile crane erected WI area 235703.00N0324923.03E 235728.34N0324918.60E 235748.23N0324915.13E 23 5813.57N0324910.70E 235826.72N0324908.40E 235840.20N0324906.05E, HGT/7M, CTN ADZ while LDG and TKOF, TFC to FLW ATC Instructions.	Crane				

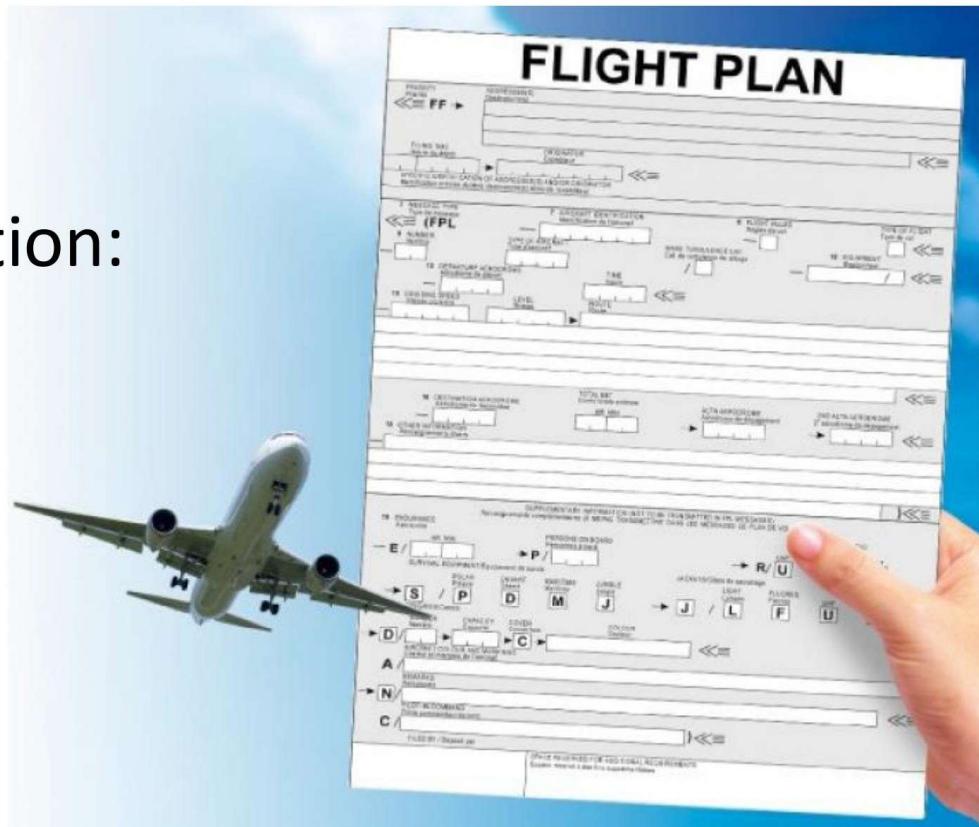
PIB

○ Pre-flight Information Bulletin (PIB)

- presentation of operationally significant valid NOTAM,
- prepared directly prior to the flight.
- Types of PIB obtained in the ATS Reporting Office (ARO):
 - Aerodrome PIB;
 - Area PIB;
 - Route PIB; and
 - Narrow route PIB.

Flight Plans

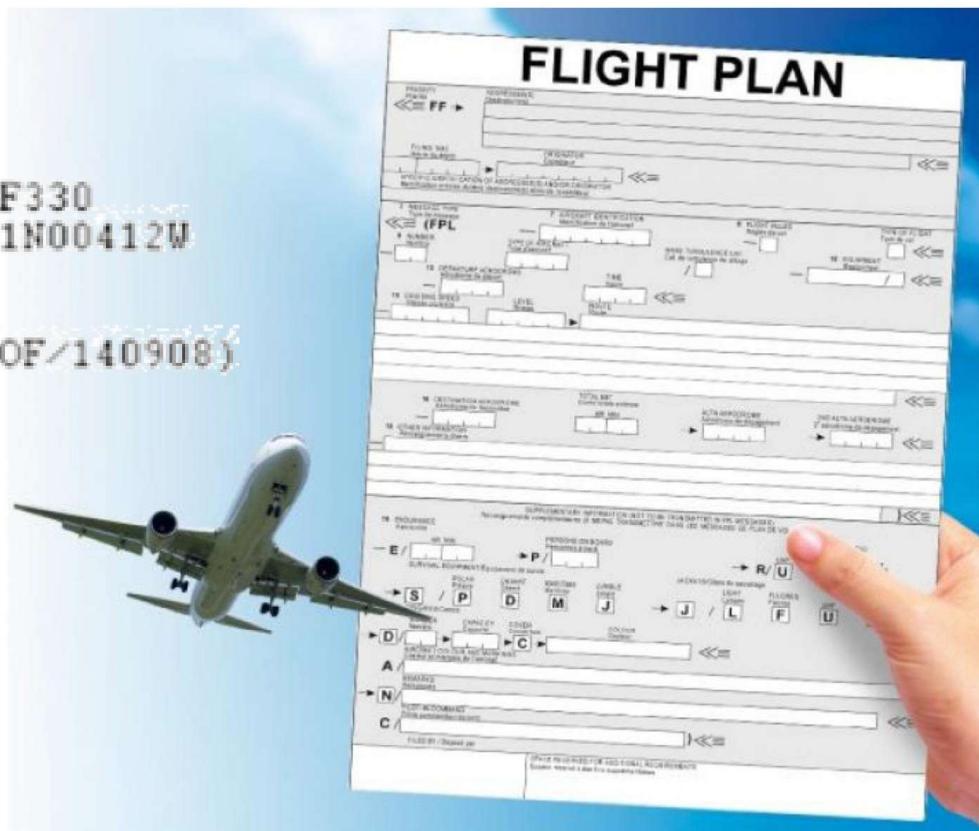
- detailed information about a proposed flight
 - Aircraft Type
 - Departure and Destination:
 - Route of Flight:
 - Altitude:



Flight Plans

○ ATS message format

(FPL -ACF402 IN
-EA30/H-S/C
-EHAM0940
-K0830F290 LEK28 LEK UA6 XMM/M078 F330
UA6 PON URION CHV UAS NTS DCT 4611N00412W
DCT STG UA5 FTM FATIMIA
-LPPT0230 LPPR
-REG/FBVGA SEL/EJFL EET/1PPC0158 DOF/140908)



CHARTING

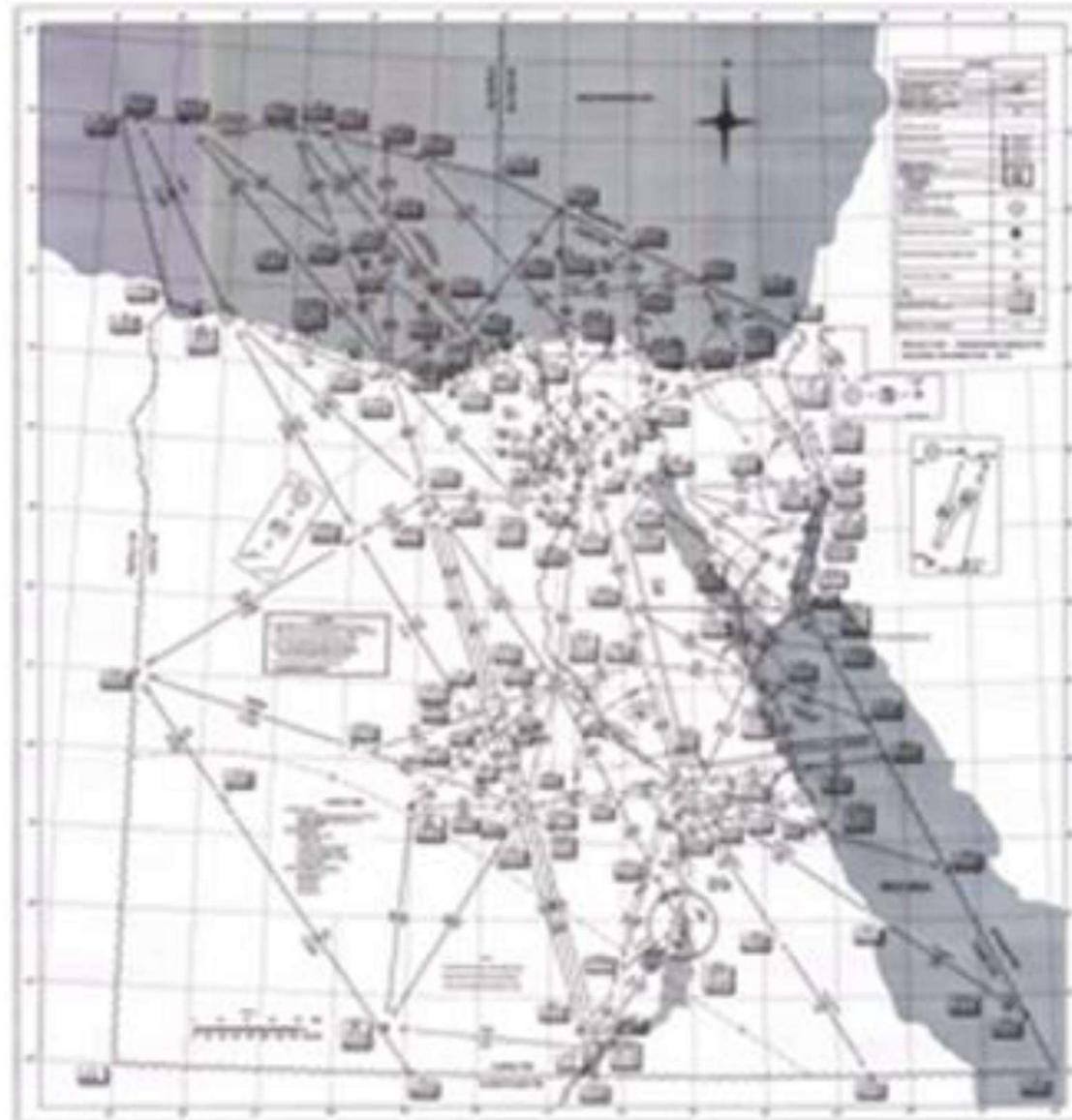
- Aeronautical Charting Products:
 - Maps
 - Procedure Charts
- Geographic Information Systems (GIS) allow you to store, digitize, analyze, map and visualize data in different ways.

CHARTS

- Types of Charts examples
 - Standard Instrument Departure
 - Standard Terminal Arrival Routes
 - Instrument Approach Charts
 - En Route Charts

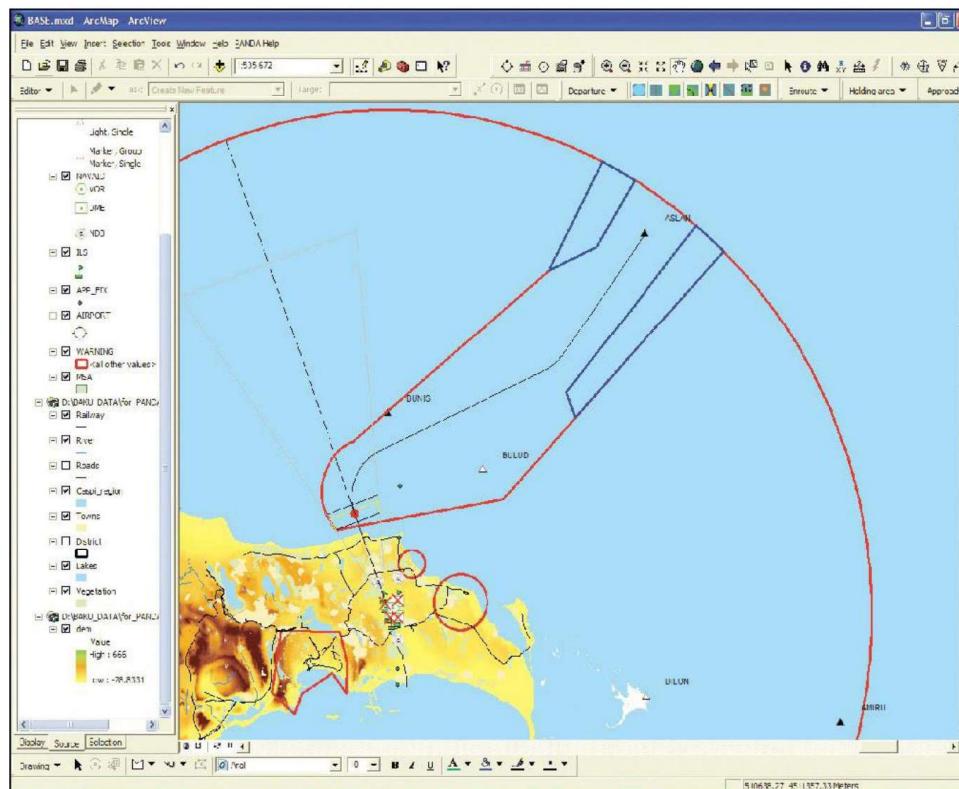
CHARTS

- En Route Charts



CHARTS

- Standard Instrument Departure (SID)

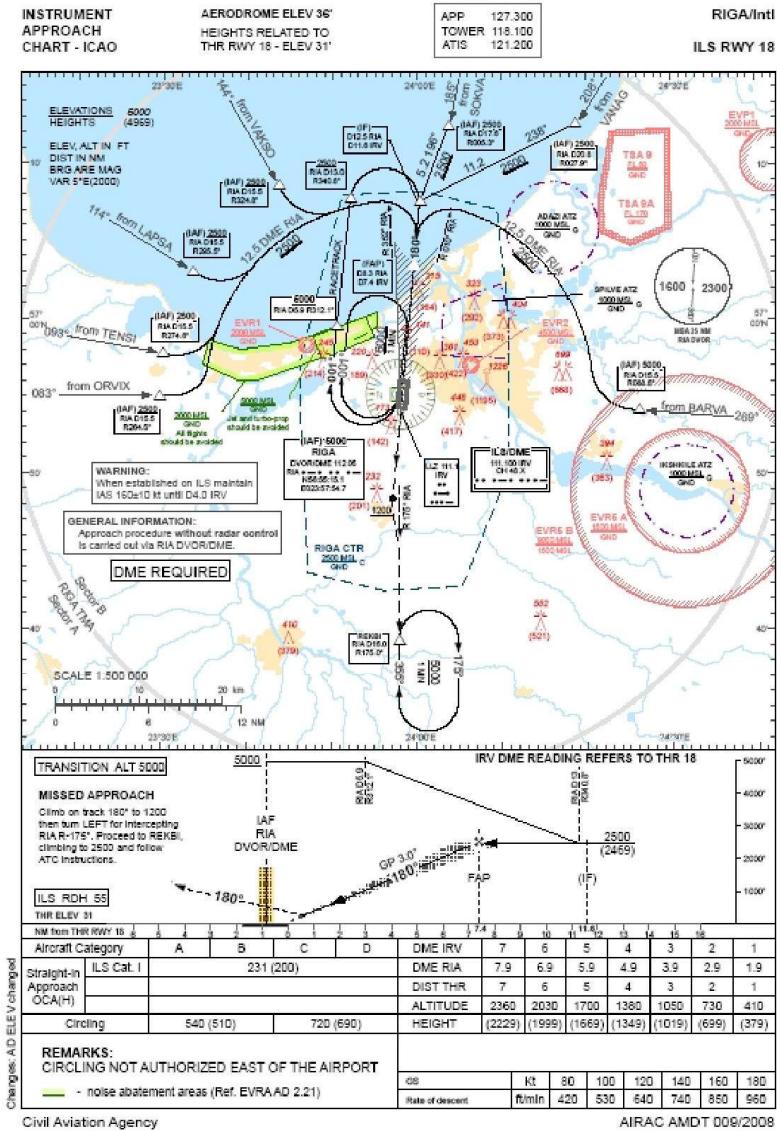


CHARTS

- Instrument Approach Charts

AIP LATVIA

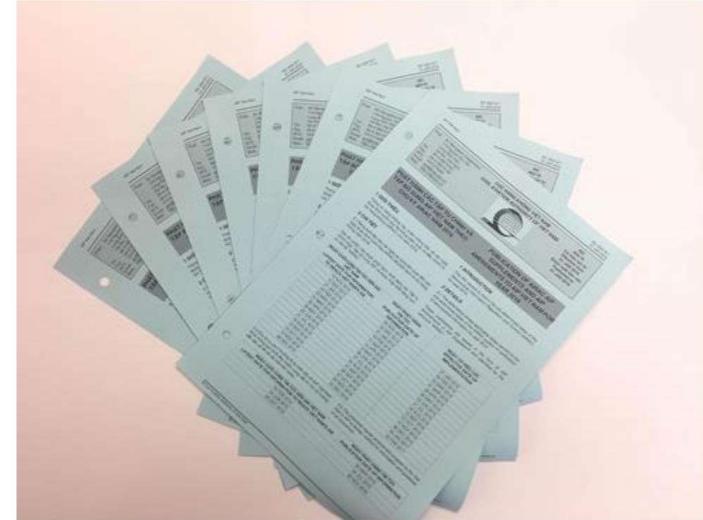
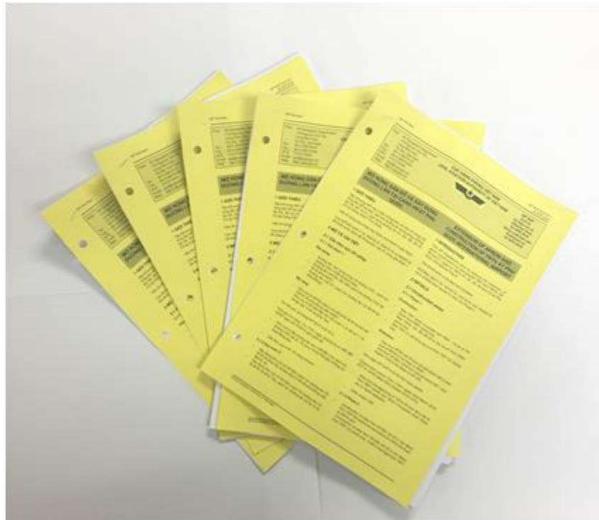
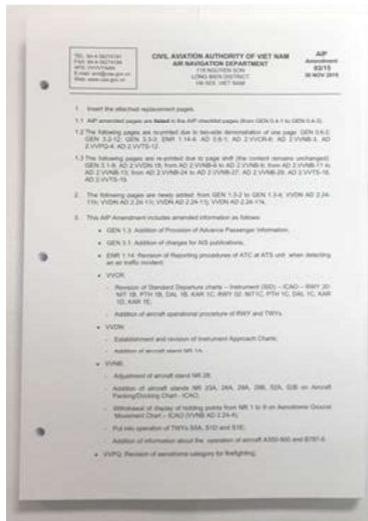
EVRA AD 2.24.11 - 1
23 OCT 2008



AIP

• Aeronautical Information Publication

- Is a publication that provides essential aeronautical information issued by or with the authority of a State.



AIP

- **Aeronautical Information Publication**

- contains aeronautical information of permanent information and long duration temporary changes essential to air navigation.
- kept up-to-date by regular revision on a fixed cycle.

AIP

• AIP Parts

- General (GEN):

- national regulations and requirements.

- En Route (ENR):

- ATS airspace, ATS routes.
 - radio navigation aids/systems.

- Aerodromes (AD):

- detailed information on aerodromes.

AIP

- AIP Amendments (AIP AMDT)
 - Permanent changes to the information contained in AIP.
- AIP Supplement (AIP SUP)
 - Temporary changes of long duration to the information contained in AIP.
- Aeronautical Information Circular (AIC)
 - a notice containing information that does not qualify for the origination of a NOTAM, for inclusion in the AIP.

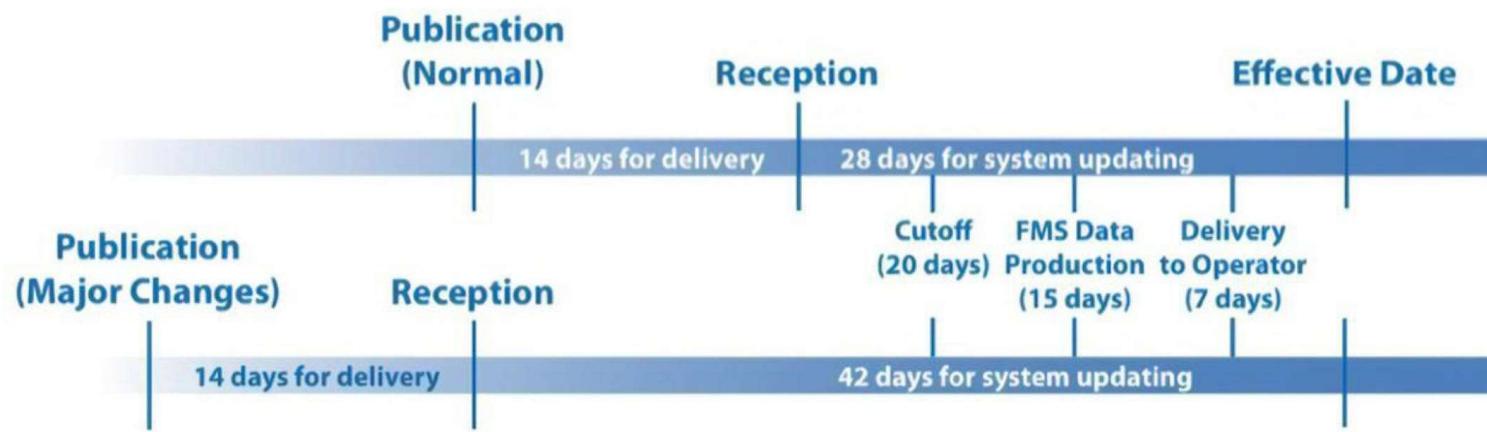
AIP - AIRAC

- Aeronautical Information Regulation And Control
 - common dates and an associated AIP procedures.
 - Pilots,
 - Air Traffic Controllers,
 - Flight Management Systems
 - Air Traffic Flow Managers,
 - and Aviation Charts.
 - All are working from the same information base

AIP - AIRAC

- Aeronautical Information Regulation And Control

AIRAC Timeline



- All are working from the same information base

AIS -Future

- AIS to AIM Aeronautical Information Management



Paper NOTAMs → Digital NOTAMs

Paper AIP → AIXM 5.1 Data



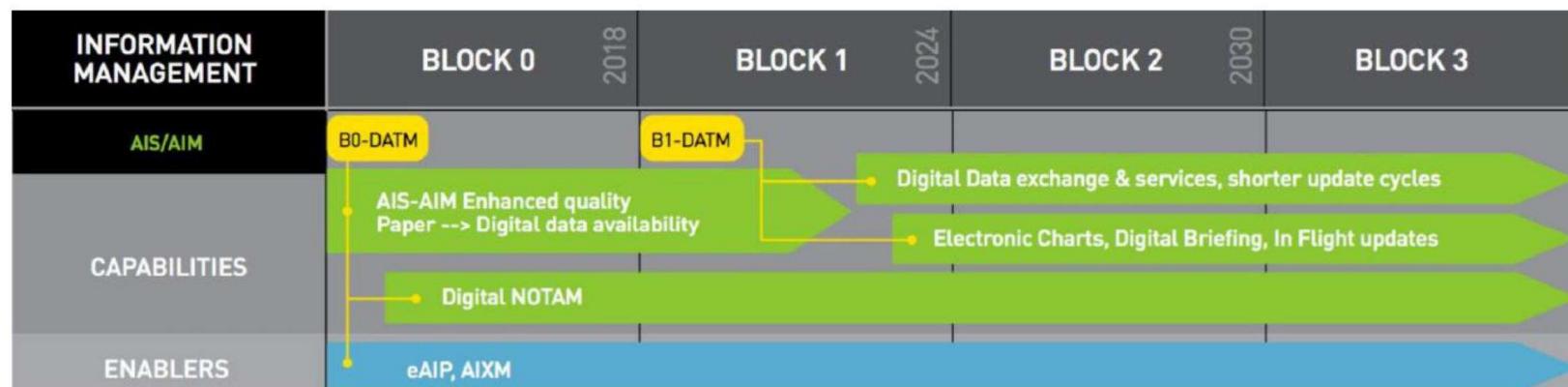
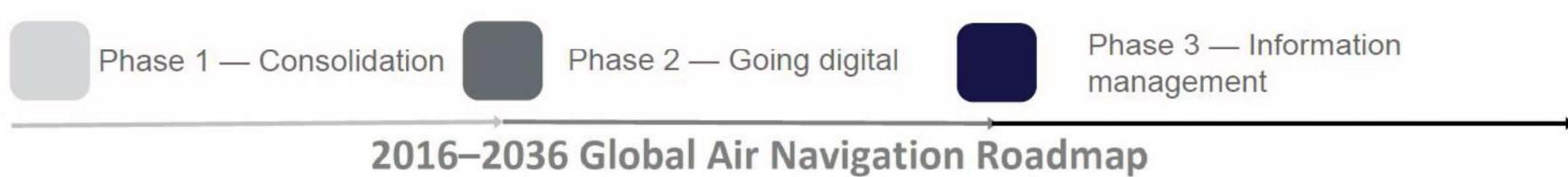
Static Information → Real Time Data



AIS -Future

- AIS to AIM Aeronautical Information Management

AIS TO AIM Phases



Global Air Navigation Plan (ICAO Doc 9750) for aeronautical information services (AIS) to aeronautical information management (AIM)

Any Questions

