

Seminar/workshop on new technologies in satellite and ground networks

(Lima, 18 to 20 July 2011)



ATS BANDWIDTH REQUIREMENTS IN THE FUTURE REDDIG

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OBJECTIVE

Describe bandwidth requirements for current and future services in REDDIG II.



CONTENT

- **Description of the main services; and**
- **Bandwidth for current and future applications**

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Current Applications

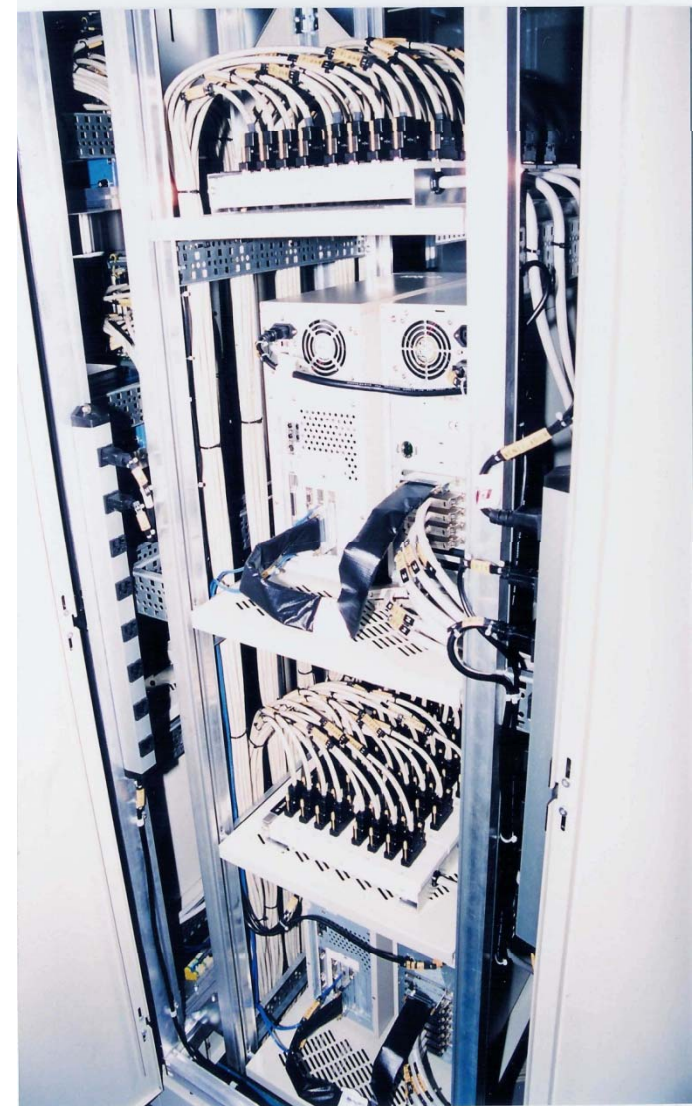


- **Switched and hot-line speech circuits;**
- **PAMA circuits for radar data;**
- **AFTN (Aeronautical Fixed Telecommunication Network) circuits for aeronautical messaging**

AFTN



- **Maximum size: 4800 characters;**
- **Average size: 300 characters;**
- **Speed used: 2400 bps**



AMHS (Aeronautical Message Handling System)

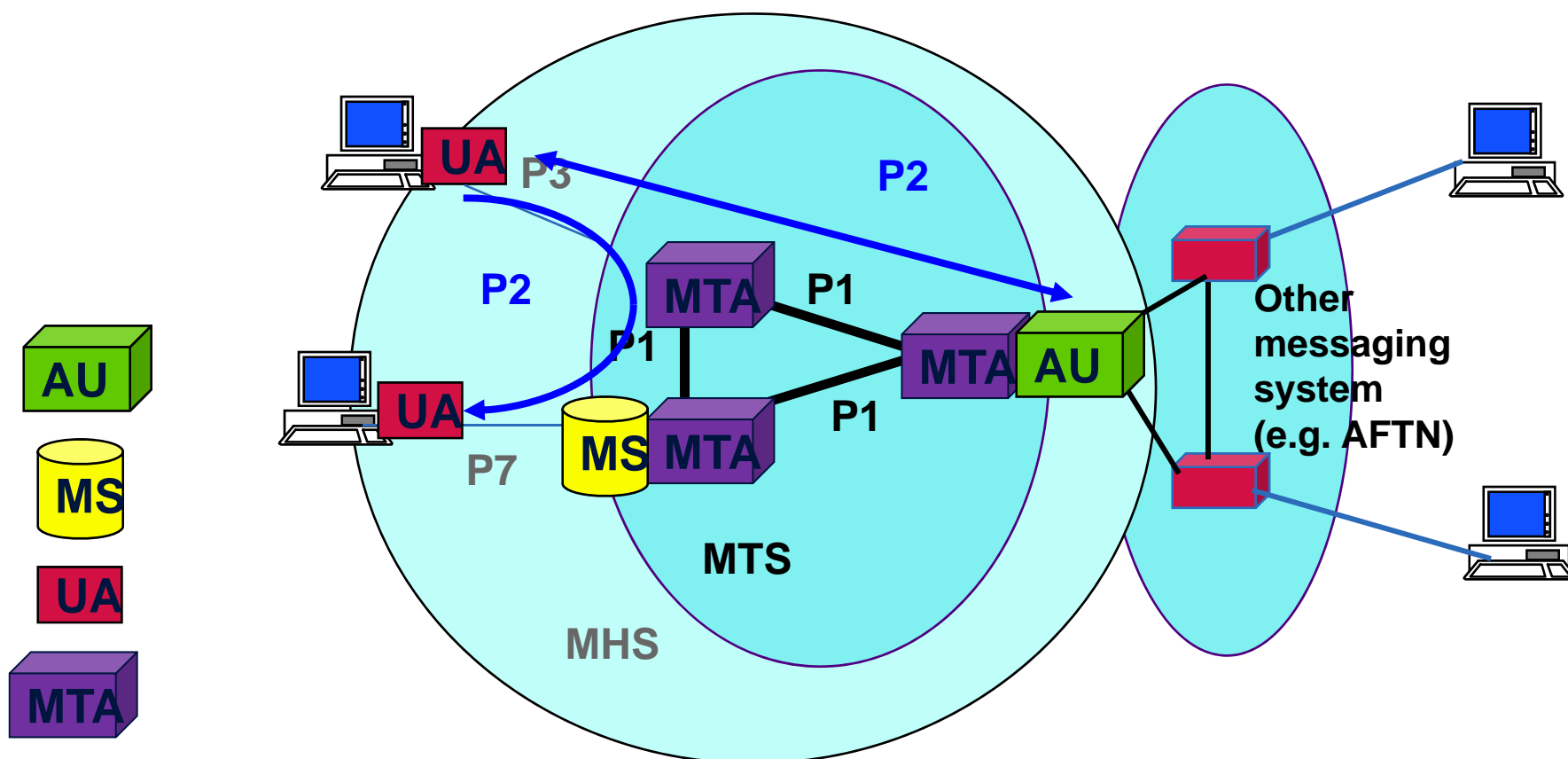


- Evolution of the AFTN;
- Compatibility with the AFTN;
- First ATN application;
- X.400 and X.500 protocols

AMHS X AFTN

- Higher speed;
- Possibility of attaching files;
- Based on IP;
- Larger message size.

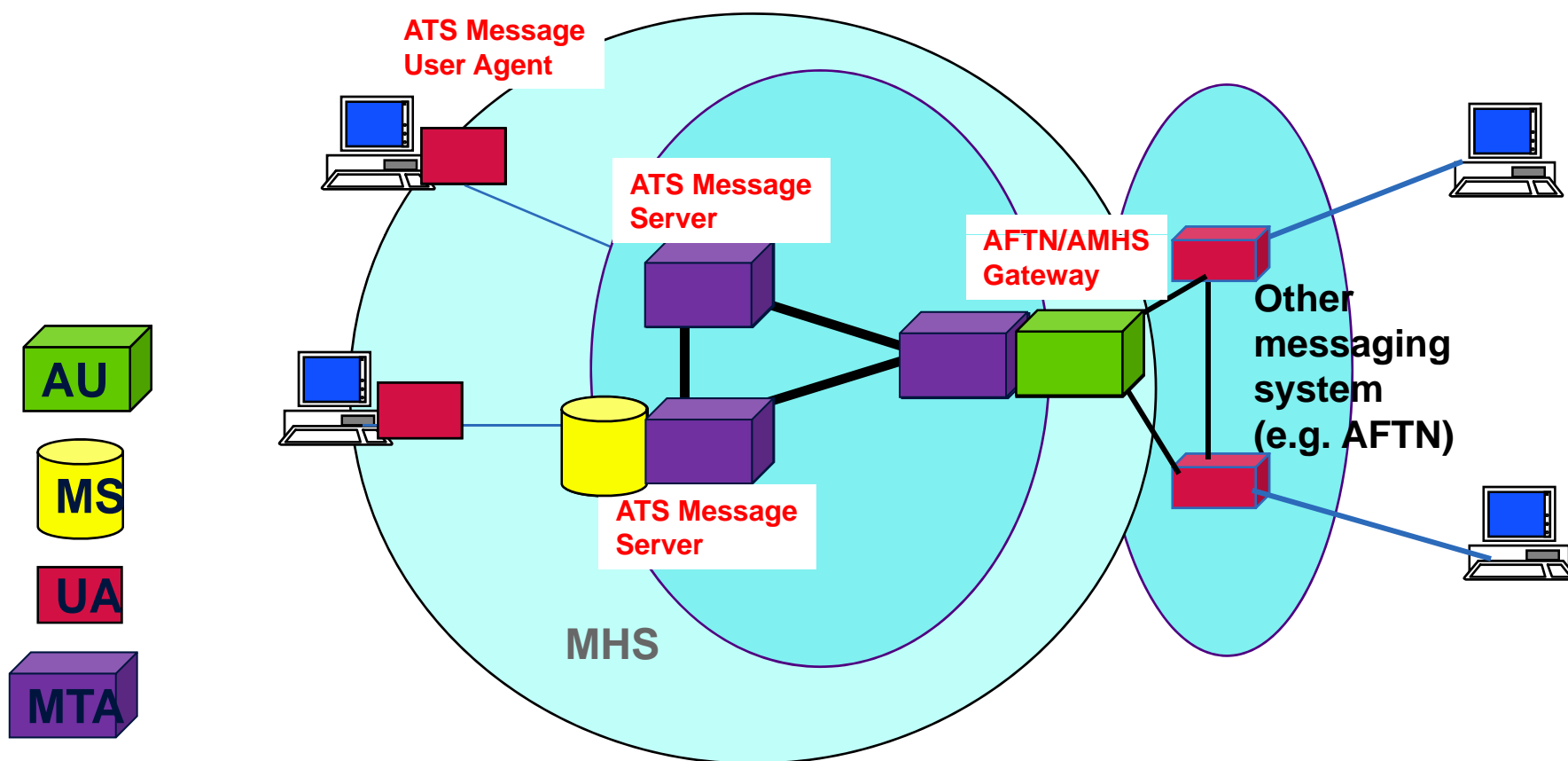
MHS



MTS = Message Transfer System

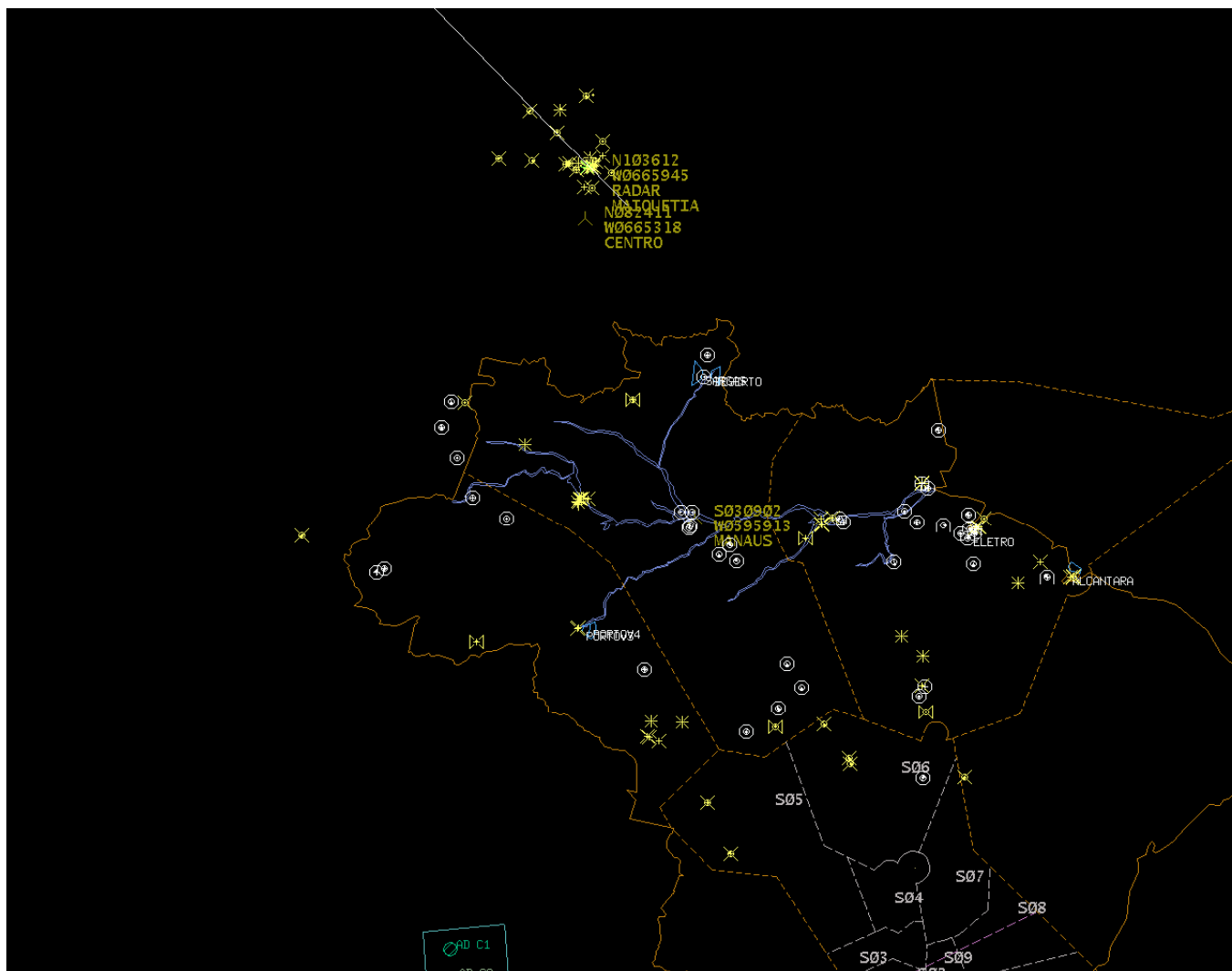
MHS = Message Handling System

AMHS



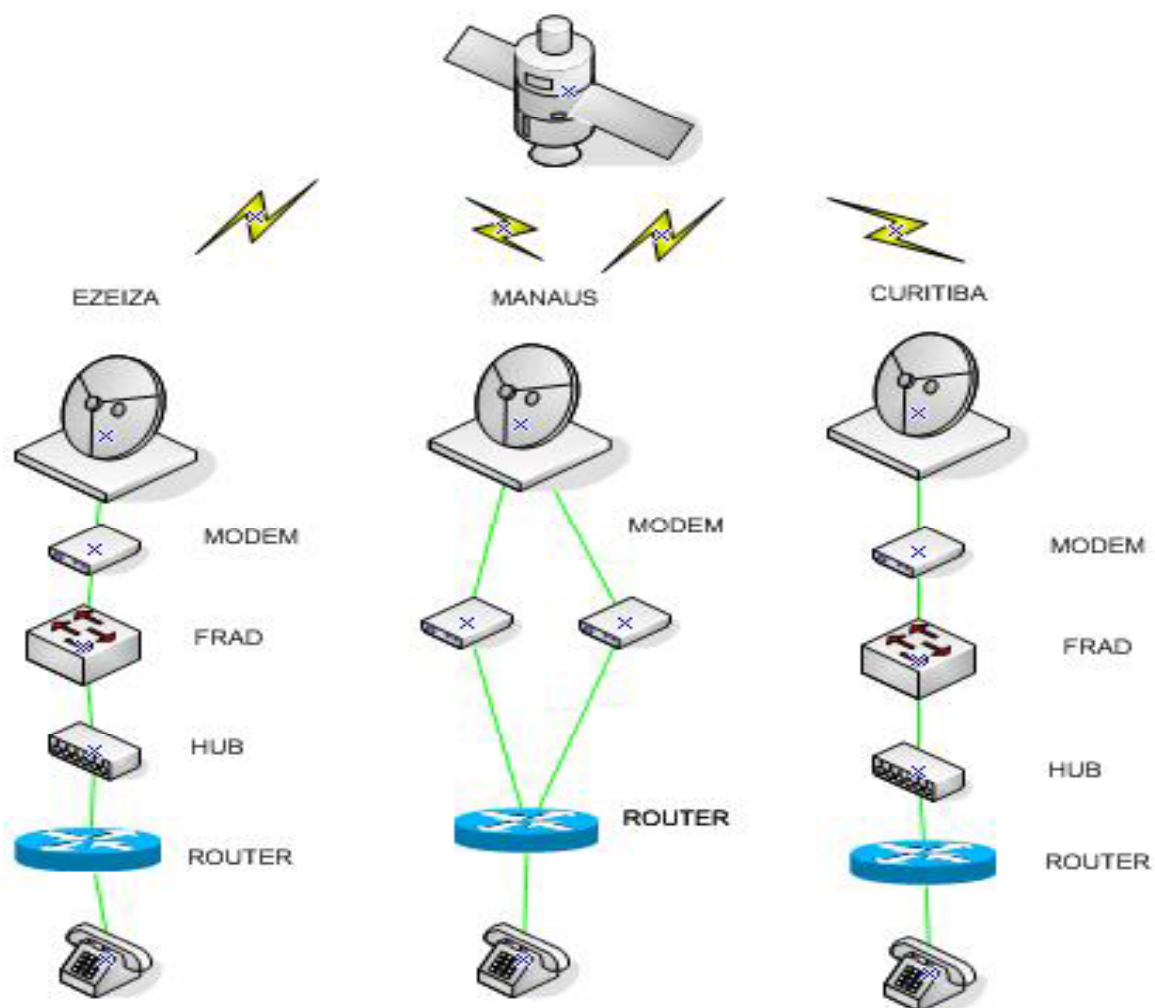
AMHS = ATS Message Handling System

Radar Data and Flight Plans



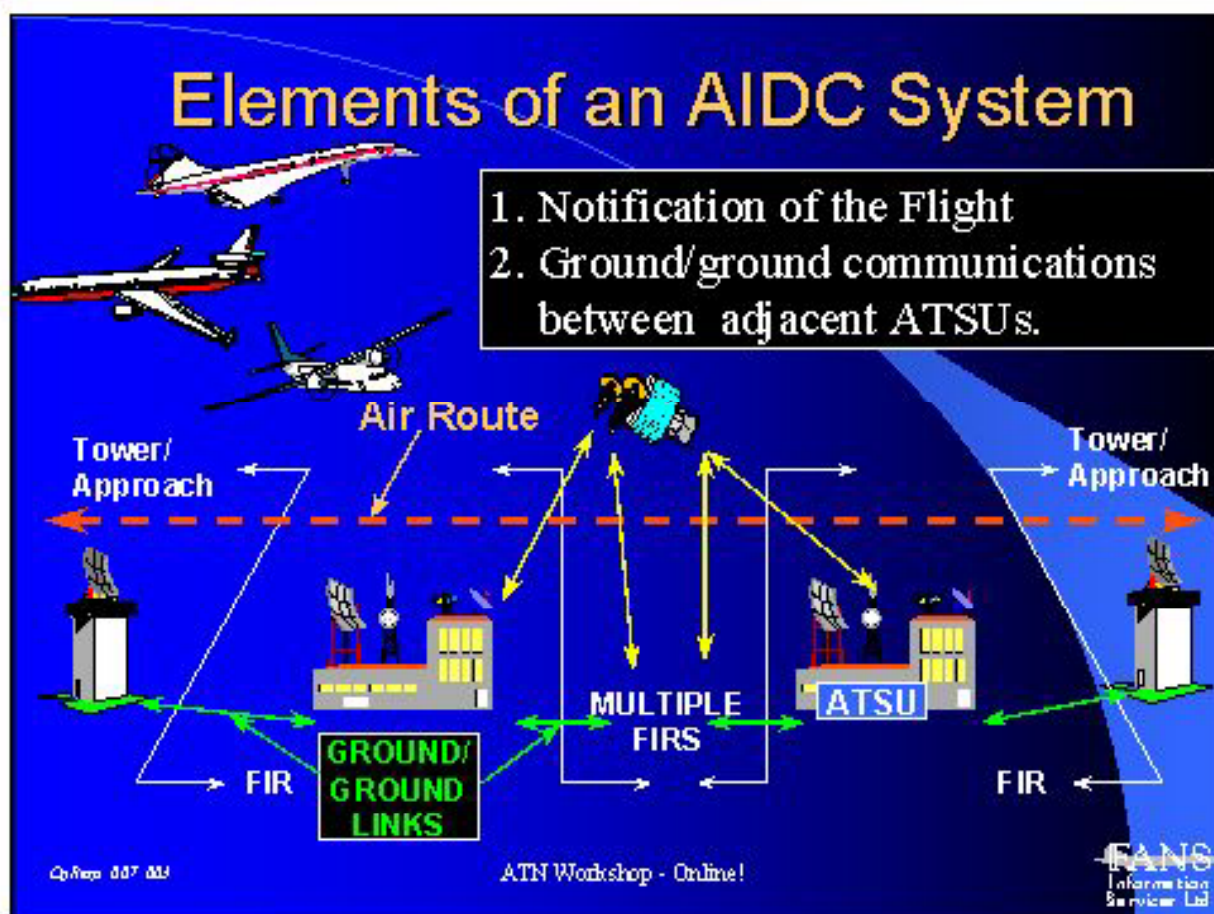


Voice Communications

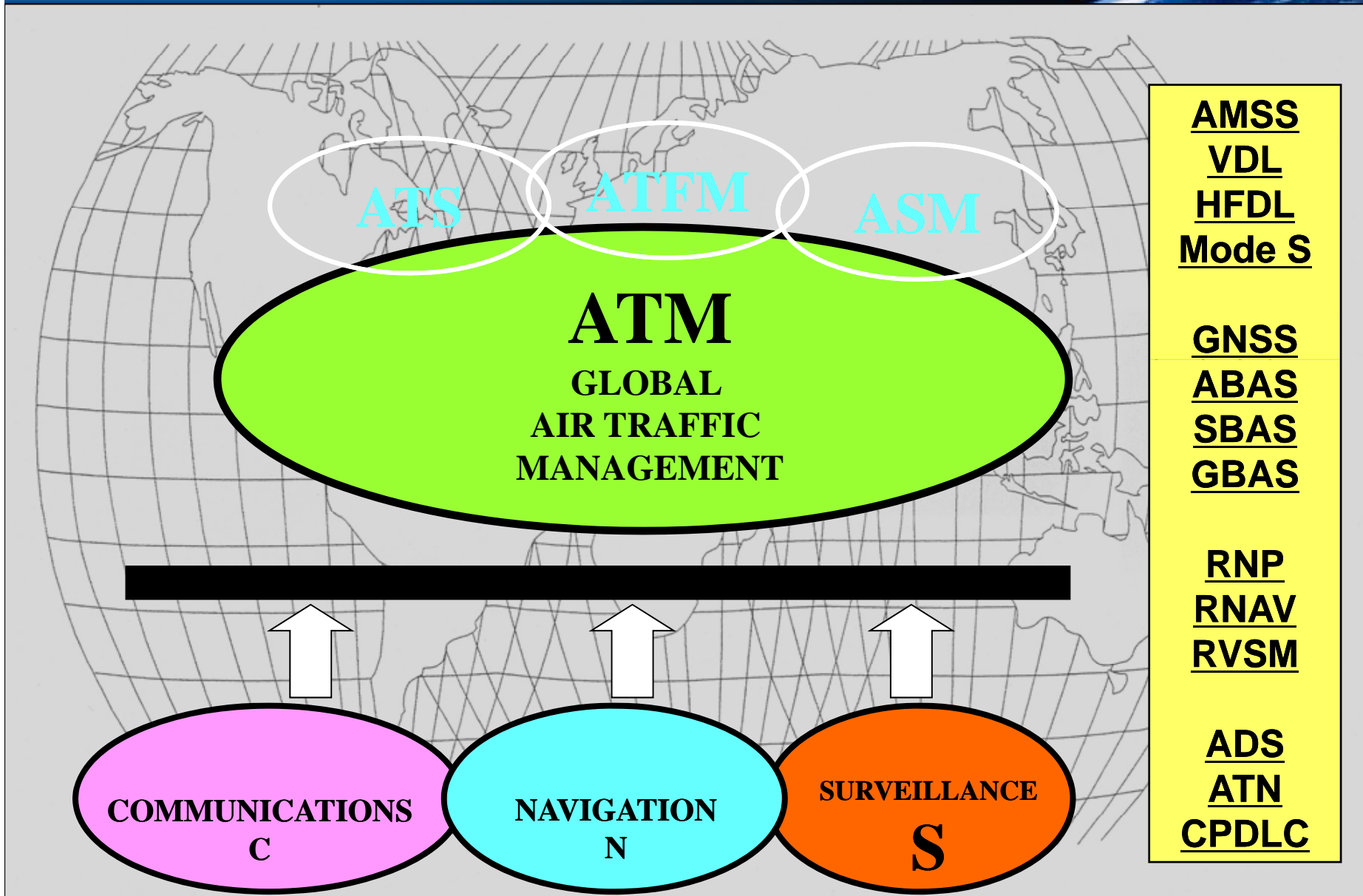


AIDC

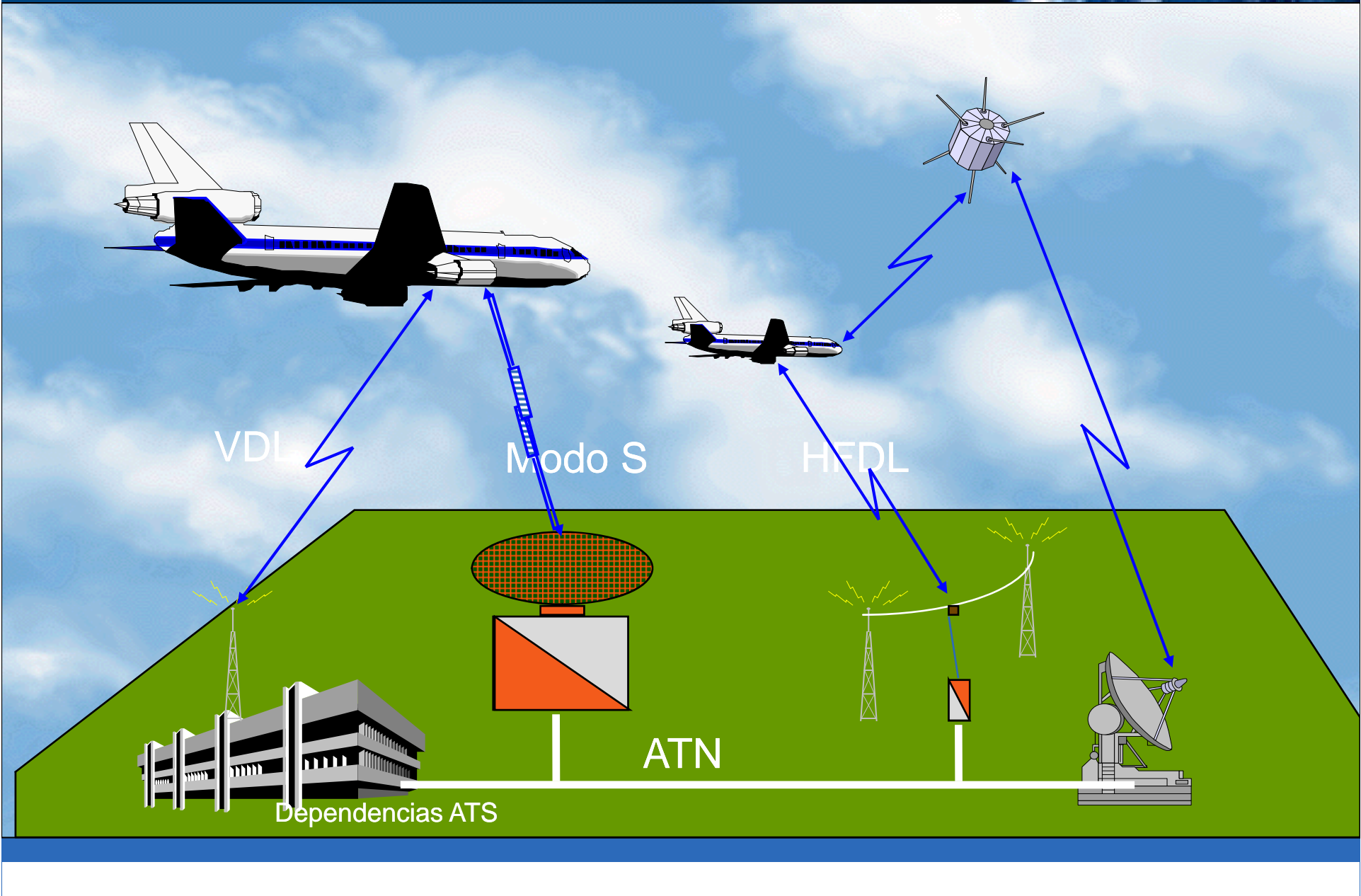
“Air traffic services interfacility data communication”



CNS/ATM SYSTEMS

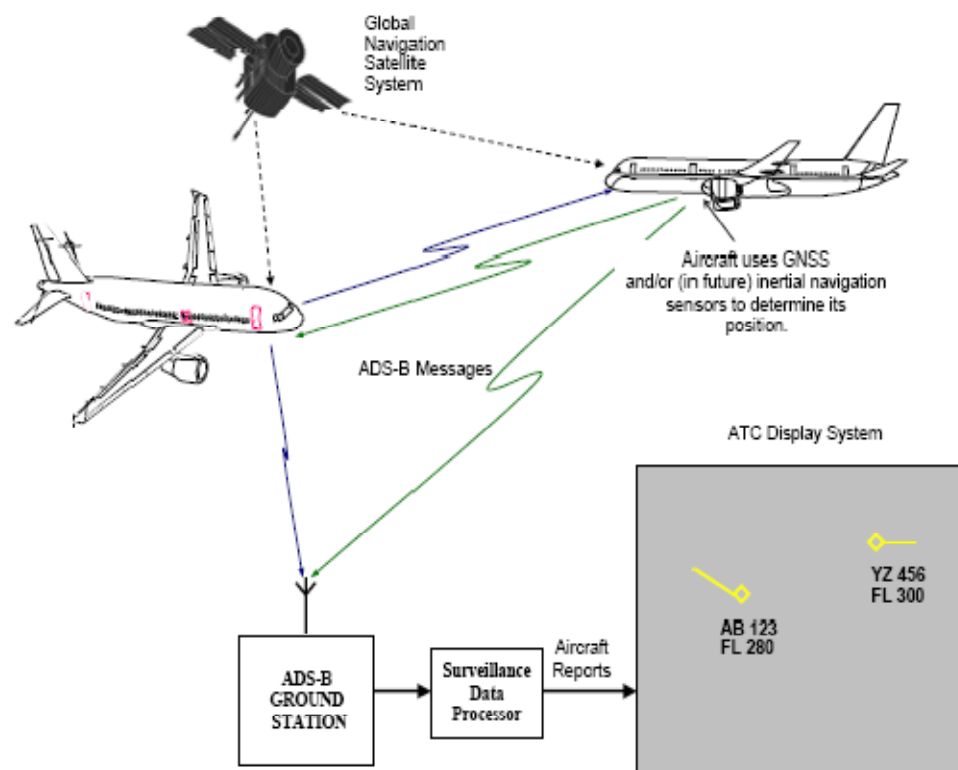


COMMUNICATIONS (C)



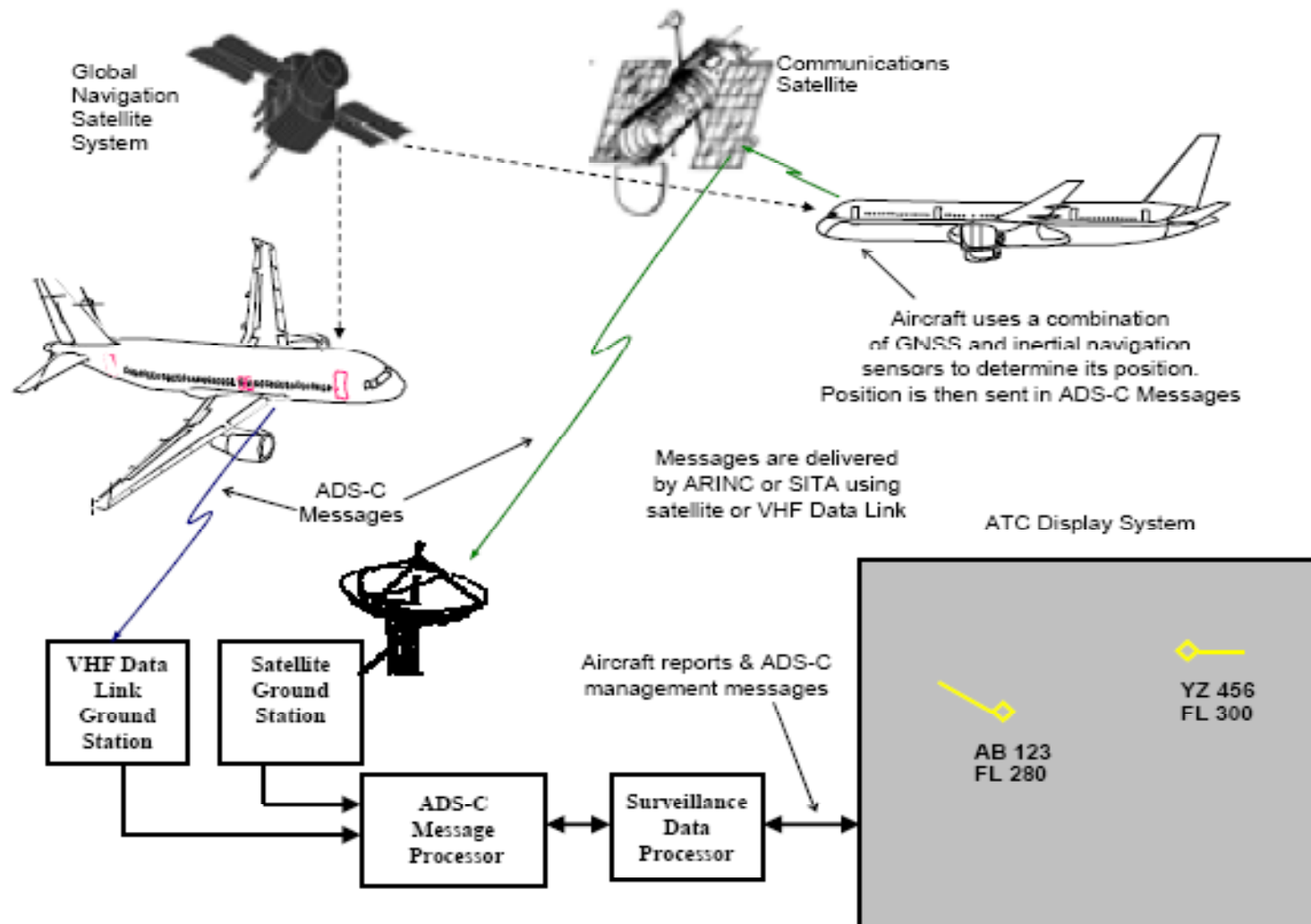
ADS-B

Automatic dependent surveillance-broadcast



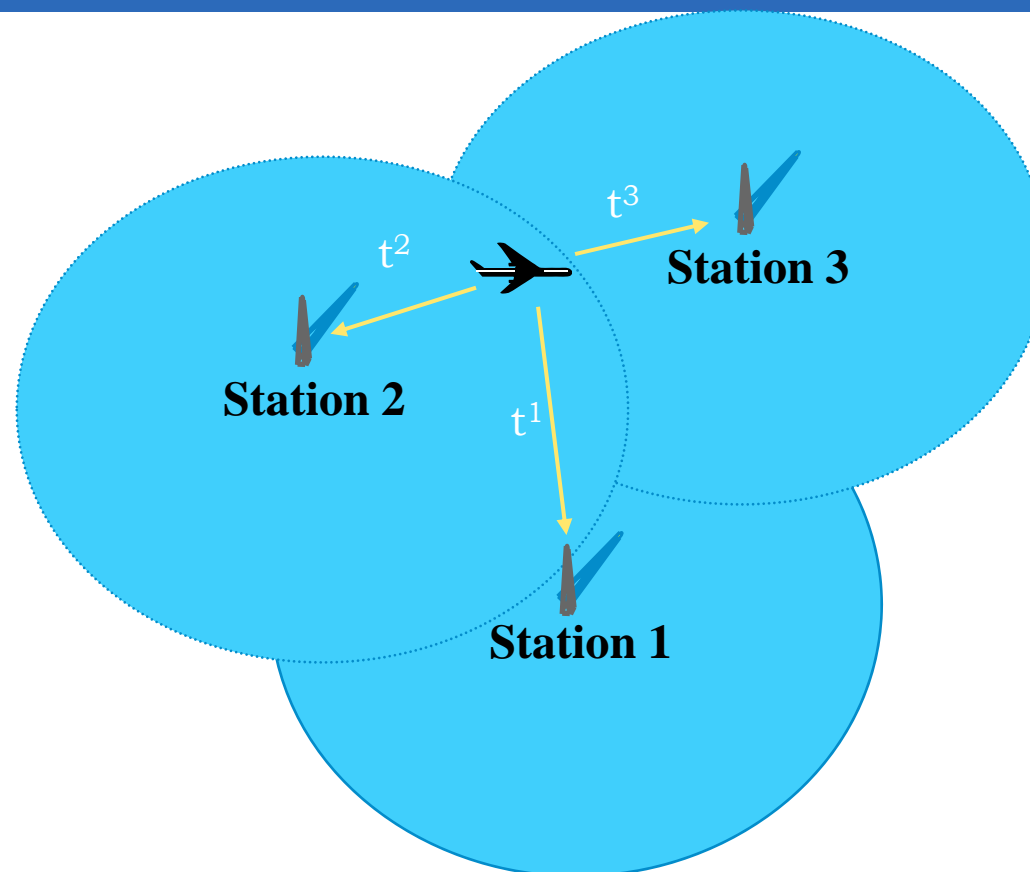
ADS-C

Automatic dependent surveillance-Contract



MULTILATERATION

- Interconnected sensor matrix
- Measures the time difference in the arrival of the signal in a number of sensors to calculate the position of the aircraft



CONTENT

- **Description of the main services; and**
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INTERFACES



Estado	Lugar	Interfaces mínimas					
		I/O Universal	Ethernet	Digital	E&M	FXO	FXS
Argentina	Ezeiza	11	1	0	11	0	1
Bolivia	La Paz	4	1	0	4	0	4
Brasil	Curitiba	4	1	0	6	2	1
	Manaos	6	1	0	7	0	5
	Recife	1	1	0	7	0	1
Chile	Santiago	2	1	0	8	0	0
Colombia	Bogotá	7	1	1	0	0	0
Ecuador	Guayaquil	3	1	1	0	0	0
Guayana Francesa	Rochambeau	2	1	0	0	0	5
Guyana	Georgetown	4	1	0	0	0	5
Paraguay	Asunción	3	1	0	3	0	3
Perú	Lima	9	1	1	0	0	0
Suriname	Panamaribo	3	1	0	0	0	4
Trinidad y Tabago	Piarco	2	1	0	0	0	6
Uruguay	Montevideo	2	1	0	0	4	5
Venezuela	Maiquetía	10	1	0	7	0	4

BANDWIDTH (Increment)



Estado	Lugar	Servicio (cada uno en Kbps)			
		AFTN	Radar	AMHS	ADS-B
Argentina	Ezeiza		76.8	28.8	19.2
Bolivia	La Paz		115.2	14.4	19.2
Brasil	Curitiba		76.8	19.2	19.2
	Manaos	9.6	134.4	33.6	19.2
	Recife		0	4.8	19.2
Chile	Santiago		57.6	9.6	19.2
Colombia	Bogotá	19.2	76.8	38.4	19.2
Ecuador	Guayaquil		38.4	14.4	19.2
Guayana Francesa	Rochambeau		38.4	9.6	19.2
Guyana	Georgetown		57.6	19.2	19.2
Paraguay	Asunción		57.6	9.6	19.2
Perú	Lima	9.6	96	43.2	19.2
Suriname	Panamaribo		76.8	14.4	19.2
Trinidad y Tabago	Piarco		19.2	9.6	19.2
Uruguay	Montevideo		19.2	9.6	19.2
Venezuela	Maiquetía		76.8	38.4	19.2
Parciales (Kbps)		38.4	1017.6	316.8	307.2
Parcial global (Kbps)		1680			
Diferencia AFTN		-103.2			
Incremento neto ancho de banda		1576.8			

TABLE 1Ba (FASID)



Apéndice 2I - Tabla CNS1b - Plan de encaminadores de la Región SAM

Administración y localidad		Tipo de encaminador	Tipo de interconexión	Encaminador Conectado	Velocidad del enlace		Protocolo del Enlace						Vía		Fecha Meta	Observaciones	
Administ	Localidad				Actual	Futuro	Capa física- enlace		Versión IP		Protocolo de enrutamiento		Actual	Futuro		Actual	Futuro
1		2	3	4	5		6						7		8	9	
Argentina	Ezeiza	IP	Inter Regional	Afl (Johannesburgo)	N/A	TBD	FDMA FR	TBD	N/A	IPv6	N/A	TBD	CAFSAT	CAFSAT	TBD	B	E
				EUR (Canarias)	19.2	TBD			IPv6	IPv6	BGP	TBD			2010	D	D
		IP	Intra Regional	Bolivia (La Paz)	N/A	TBD	TDMA FR - ISDN	TBD	N/A	IPv4	N/A	BGP4	REDDIG	REDDIG II	2012	B	F
				Chile (Santiago)	N/A				N/A		2011				B	F	
				Brasil (Curitiba)	N/A				N/A		2011				B	F	
				Brasil (Manaos)	64k				IPv4		Estatico				2010	D	N/A
				Paraguay (Asunción)	64K				IPv4		Estatico				2009	B	F
				Uruguay (Montevideo)	64k				IPv4		Estatico				2010	C	F
Bolivia	La Paz	IP	Intra Regional	Argentina (Ezeiza)	N/A	TBD	TDMA FR + ISDN	TBD	N/A	IPv4	N/A	BGP4	REDDIG	REDDIG II	2012	B	F
				Chile (Santiago)	N/A				N/A		2012				B	F	
				Brasil (Manaos)	N/A				N/A		2012				B	F	
				Brasil (Curitiba)	N/A				N/A						B	F	
				Paraguay (Asunción)	N/A				N/A						B	F	
				Perú (Lima)	N/A				N/A		2012				B	F	

A	AFTN
B	AFTN + Oral ATS
C	AFTN + Oral ATS + radar
D	AMHS
E	AMHS + AIDC + teleconferencia
F	AMHS + AIDC + teleconferencia + radar





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Describe bandwidth requirements for current and future services of REDDIG II

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