

Avitech Presentation to



International Civil Aviation Organization



**AIR TRAFFIC MESSAGE HANDLING SERVICE
(AMHS) IMPLEMENTATION PLANNING
WORKSHOP**

Bangkok, Thailand, 27 – 28 January 2010

At - Friedrichshafen - Frankfurt - Bratislava



Avitech

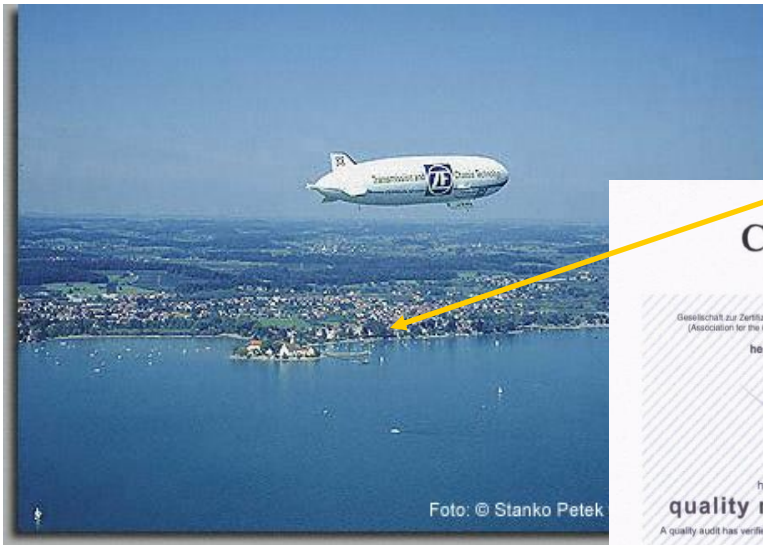


Foto: © Stanko Petek



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Origin: ATC business of AEG Telefunken (1963)

Consolidation ATC business Deutsch Aerospace (1991)

Joint Venture Nortel and Dasa (1995)

Joint venture Nortel Dasa & Frequentis Nachrichtentechnik (1998)

Take-over of 20 % by Avitech GmbH Management (2000)

Avitech Aviation Management Technologies GmbH (2000)

Rename 2002: Avitech AG – Ownership restructure

Turnover 2003: €4.1m

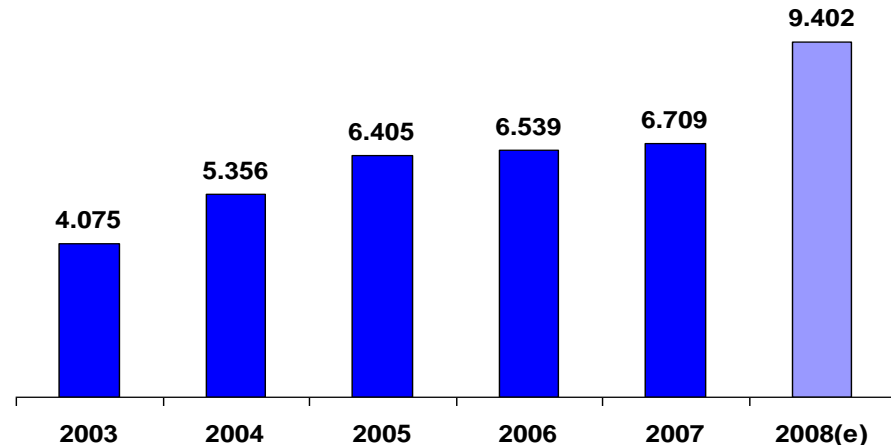
Turnover 2006: €6.5m

Turnover 2007: €6.7m

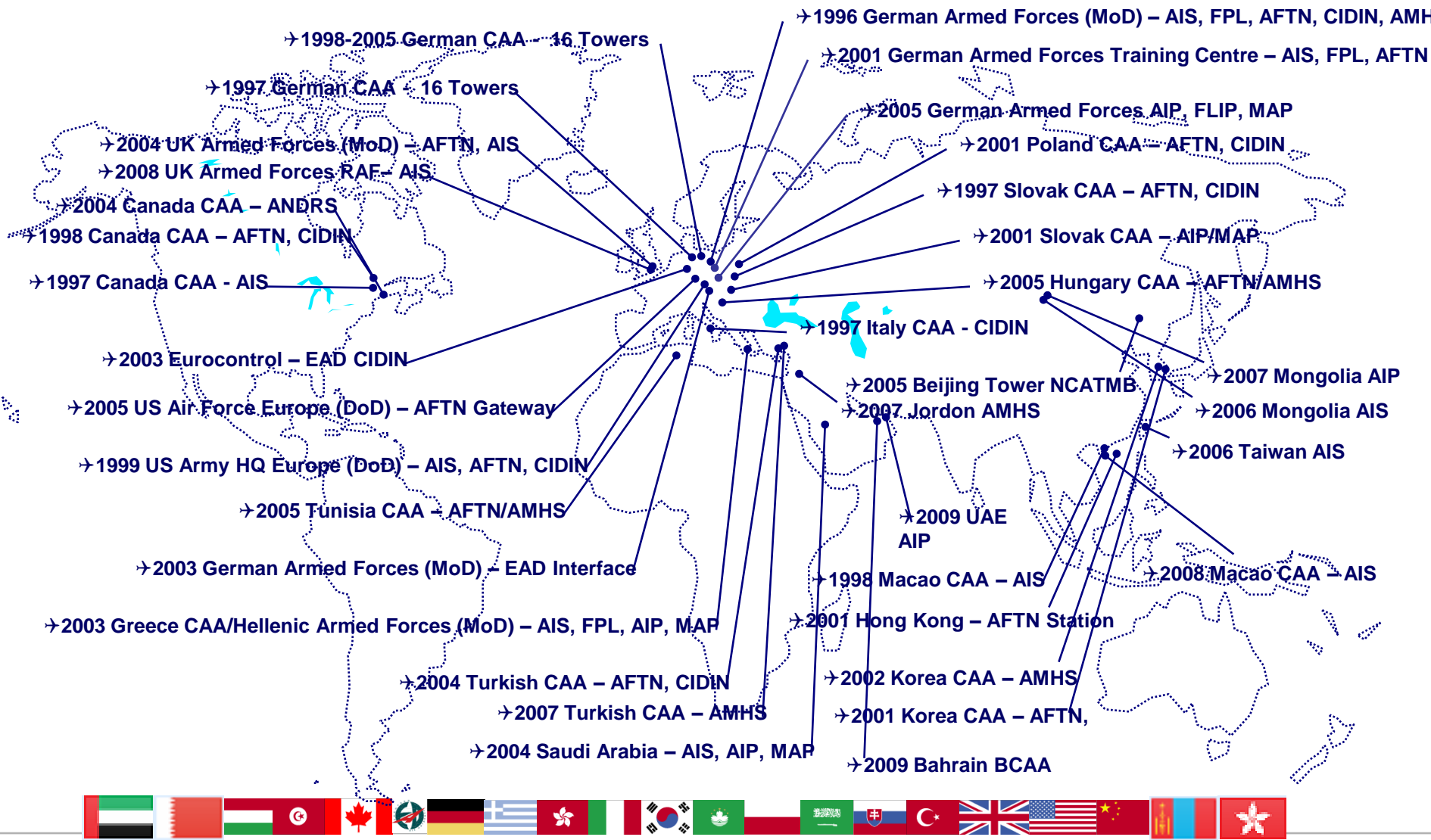
Turnover 2008: €9.4 m

Turnover 2009 €10.1m

New Ownership 2010



→ AIM – MHS – ATM References



→ **Data Communication Systems**

- Message Handling Systems – MHS and AFTN/CIDIN AMHS Gateways
- Turnkey ATC - Network Infrastructure – Countrywide Communication Networks
- AFTN PC and AMHS UA User Terminals
- ATN X400 and X500 switching systems - ATN Directory Services

→ **Air Traffic Management Systems**

- Tower Information & Integration Systems - TIMS
- Turnkey ATM and Tower Solutions
- ATIS, Tower Communications.

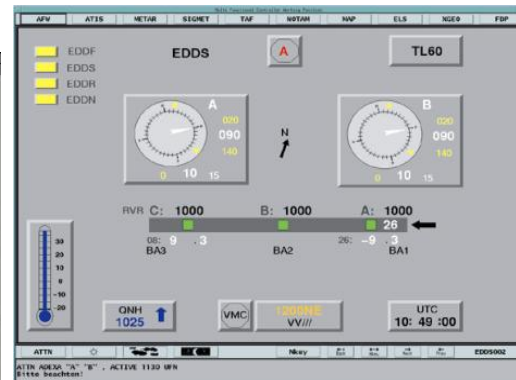
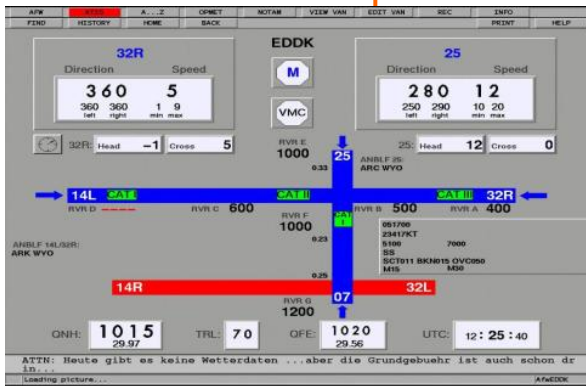
→ **Aeronautical Information Services Systems - AIS**

- Aeronautical Static and Dynamic Database (AIXM) - Web Access
- Automated NOTAM & OPMET Database
- Integrated METEOROLOGICAL Briefing
- Flight Plan Database (ICAO, Eurocontrol)
- Automated AIP and Chart Preparation/Conversion/Publishing
- Common AIS/AFTN/AMHS User Terminals – AviTerm

→ **Service, Maintenance, Training, Design and Consultancy, Data Migration**



TIMS Tower Information Management System



- Integrated Controller Displays
- Tower Networking
- Airport Weather Information
- Automatic Terminal Information Service (ATIS)
- NOTAM, OPMET, maps, airfield conditions, ...
- Charts and Procedures
- AWOS
- Electronic Flight Strip Systems
- Stand Management



AIM Aeronautical Information Management Systems



eAIP.wiz@rd



eSDO.wiz@rd



eMAP.wiz@rd



eTOD.wiz@rd



eADP.wiz@rd



eFLIP.wiz@rd

- Automated NOTAM Database
- FPL Database ICAO/IFPS/CFMU/TACT
- Interface to EAD (AIXM 3.3 & 4.5)
- Intergated Briefing – Met FPL Notam PD
- eAIP - AIP Publications
- eMAP - Chart Production
- eTOD – Obstacle Database
- eSDO - Integrated Aeronautical Static DB
- eFLIP - NATO Publications
- Mission Planning & ASM
- ICAO AICM Database (V4.5 ++)(V5.1)



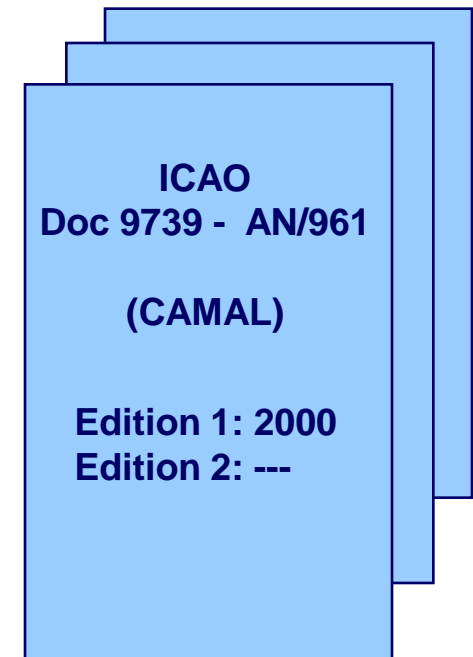
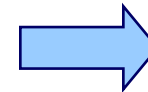
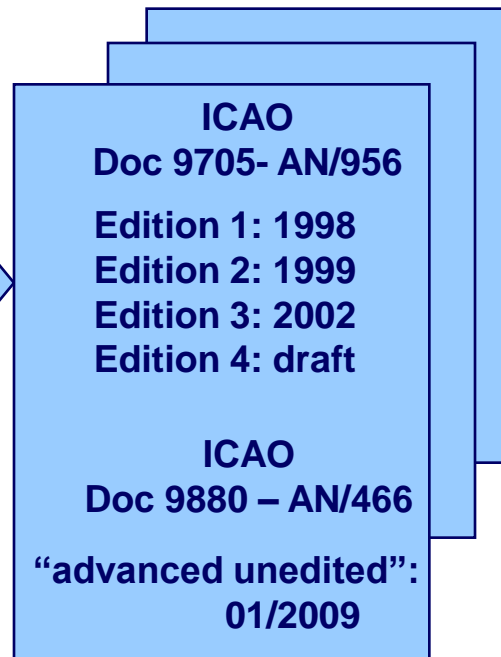
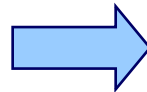
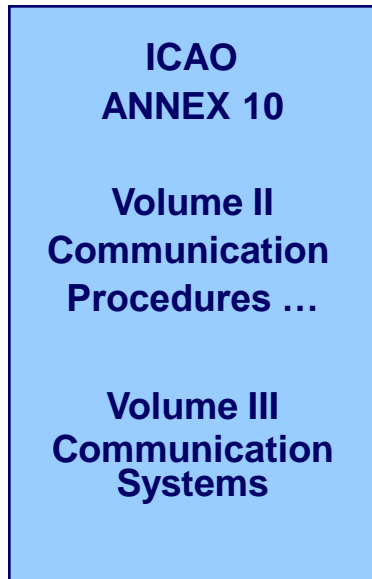
Message Handling Systems (ADAMS)

- Based on latest ICAO SARPS standards
- AFTN-CIDIN-AMHS Switches & Gateways
- ➔ Integrated User Terminals with AFTN and/or AMHS P3/P7 protocol
- AMHS and Directory User Agents
- ATN /ISP Router Integration
- Turnkey Aeronautical Communication Systems
- ATN National Networking infrastructure design
- Seamless Transition Consultancy from AFTN

Regulatory provisions

Technical Specification (SARPs)

Guidance Material



ATN: Vol. III, Part I,
Chapter 3

AMHS: Doc 9880, Part II B
AFTN/AMHS Gateway: Chap. 4

AMHS: Part III, Section 6

EUR Documents

- ➔ ICAO EUR Doc 020 – EUR AMHS Manual, V4.0, 02-04-2009
 - Appx. A: Abbreviations, Glossary and Definitions
 - Appx. B: European ATS Messaging Service Profile
 - Appx. C: AMHS Testing Requirements
 - Appx. D: AMHS Conformance Tests
 - Appx. E: AMHS Interoperability Tests
 - Appx. F: AMHS Pre-Operational Tests

- ➔ ICAO EUR Doc 021 – ATS Messaging Management Manual, V5.0, 22-05-2009

- ➔ ICAO EUR Doc 022 - AFS Security Guidelines
- ➔ EUROCONTROL Specification on the Air Traffic Services Message Handling System (AMHS), edition 2.0, 18-09-2009



AMHS Conformance Test Statement

The following AMHS Implementation Under Test (IUT) has been subjected to the AMHS Conformance Tests:

FSInfoSysBw Reference System

Amt für Flugsicherung der Bundeswehr (AFSBw)

Bundeswehr Air Traffic Services Office (BATSO)

(The system specification of the IUT is detailed at the following page.)

All Conformance Test cases for the *Basic ATS Message Service* as described in ICAO EUR Doc 020 - EUR AMHS Manual, Version 3.0, Appendix D have been performed with the AMHS Test Suite at

Friedrichshafen (Germany), 29th and 30th of April, 2008

The AMHS Implementation Under Test (IUT) has *not* been shown by conformance testing to be *non-conformant* to the specified AMHS SARPs (ICAO Manual of Provisions for the ATN, Doc 9705, Third Edition 2002, including the respective PDR listed in the Test Report) except for the following test cases: CT411, CT704, CT705 and CT706.

Based on the test results we confirm that no observations which would prevent from interoperability with other AMHS X.400 (1988) implementations have been made.

The purpose of conformance testing is to increase the probability that different implementations can interwork. However, the complexity of protocols makes exhaustive testing impractical on both technical and economic grounds. Furthermore, there is no guarantee that an IUT which has passed all the relevant tests conforms to a specification. Neither is there a guarantee that such an IUT will interwork with other systems. Rather, the passing of the tests gives confidence that the IUT has the stated capabilities and that its behaviour conforms consistently in representative instances of communication.

Page 1 of 2

This AMHS Conformance Test Statement shall not be reproduced except in full without the written permission of the tester (AC-B GmbH) and shall not be quoted out of context.

AMHS Conformance Test Statement
FSInfoSysBw Reference System
Amt für Flugsicherung der Bundeswehr (AFSBw) Bundeswehr Air
Traffic Services Office (BATSO)



The AMHS Conformance Tests have been performed with the following configuration:

IUT	Identification and Version
Computer Hardware	HP Server rp5470, 2 node cluster
Operating System	HP-UX B11.11
ATN/X.400 Software	Isode M-Switch/M-Vault R14.2v0
AMHS/MTCU Software	Avitech r3-34-12
AFTN Software	Avitech r3-34-12

User Terminals	Identification and Version
AMHS User Agent	Avitech hafam-t1-atu-1.0.2-SNAPSHOT-install120080417
AFTN User Terminal	Avitech AFTN Station 6.5.0.1

Test Equipment	Identification and Version
Computer Hardware	Dell Precision M70 Notebook
Operating System	Linux Fedora FC5, VMware WS 5.5
X.400 Software	Isode M-Switch, Rel. 11.5v4
Test Software	AC-B test application TEVA 2007, TEVA test scenarios EURAMHS 3.0

This Conformance Test Statement applies only to the above hardware and software configuration. For test result details, please refer to the associated AMHS Conformance Test Report.

RECOMMENDATIONS

Based on the analysis of the test results and the analysis of the supplier the following recommendations are made:

Note: Please refer to the associated AMHS Conformance Test Report.

After software modifications we recommend to perform regression tests with the AMHS Test Suite.

Markdorf (Germany), 08th of May, 2008



Rainer Hoffmann (AC-B GmbH)

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AMHS Interoperability Test Statement

AMHS Interoperability Tests were carried out on 3rd of August 2009 between the following AMHS Implementations Under Test (IUTs):

Integrated AMHS/AFTN/CIDIN Test Switch
Austro Control COM Centre
Vienna, Austria
Supplier: Thales Air Systems S.A.

and

Integrated AFTN/AMHS Test System
HungaroControl COM Centre
Budapest, Hungary
Supplier: Avitech AG

All test procedures as described in ICAO EUR Doc 020 - EUR AMHS Manual, Version 4.0 dated 02/04/09, Appendix E - except for the optional trilateral test procedures - were performed without any failure or any need for re-test. A detailed Test Report is provided in the document AMHS_INTEROP_RPT_HU-AT_001¹.

Based on the test results we conclude that the implementations in Vienna and Budapest are interoperable.

 **HungaroControl Zrt.**
1675 Budapest, Pf. 80

HungaroControl

AUSTRO CONTROL GmbH
Abteilung
A-1030 Wien, Schmirchgasse 11

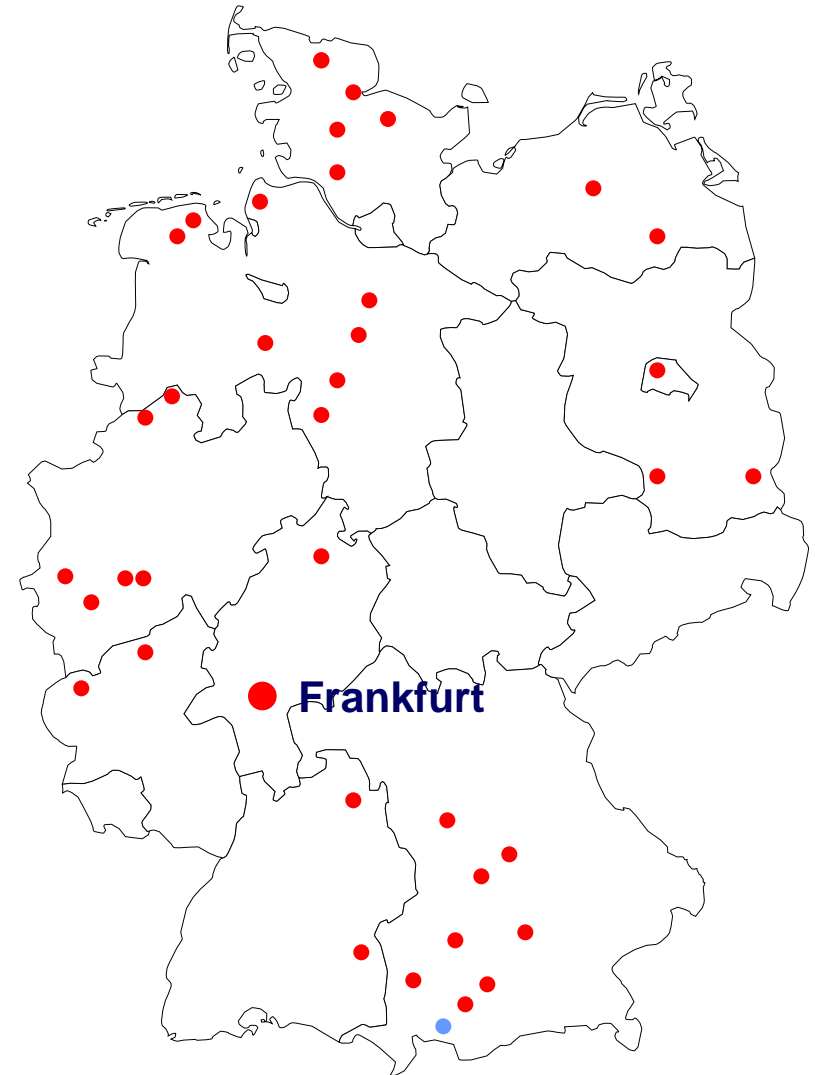
Austro Control

- ICAO Eur Doc 020 – AMHS Manual Version 4.0 Appendix E
- completed 3rd August 2009
- No Trilateral Procedures
- Full detailed tests completed.
- No retest of any function required
- Interoperability successfully concluded
- Thales & Avitech AMHS
- Fully documented test results

- During or after SAT: AMHS Conformance Tests
 - according to EUR AMHS Manual, Appx. F
 - perform once (per release)
 - preferably with test system
 - success decides about feasibility of Interoperability Tests
- After successful Conformance Tests: AMHS Interoperability Tests
 - according to EUR AMHS Manual, Appx. E
 - perform with each partner
 - preferably with test system
 - Success decides about feasibility of Pre-operational tests
- After successful Interoperability Tests: AMHS Pre-operational Tests
 - according to EUR AMHS Manual, Appx. F
 - perform with each partner
 - with operational systems
 - migration to operational use of the AMHS link at the end of successful Pre-operational tests

German Federal Armed Forces (Air Force, Army, Navy)

- 30 Airbases
- Integrated AIM MHS terminals
- System Command Centre
- MIL NOTAM-Office
- Flight Planning
- Pilot Briefing
- eAIP, eMAP, eSDO, eODB, eFLIP
- AFTN/AMHS/CIDIN Switch
- COM System to other NATO countries
- COM System to DFS
- First AMHS network world-wide
- *In operation since 1998*

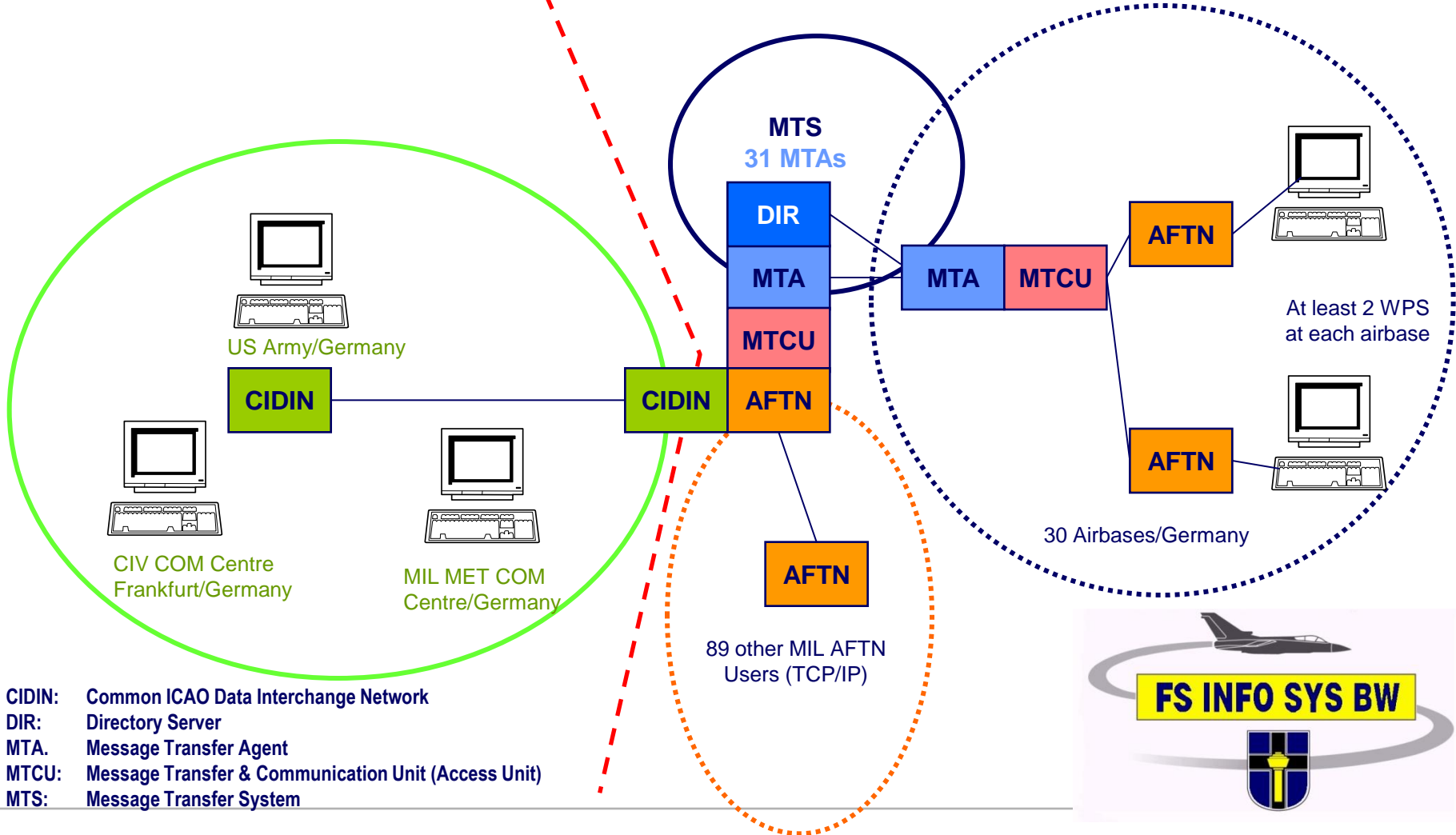


Germany – AFS– AMHS



Other Networks/Communication Partners

German Armed Forces Managed

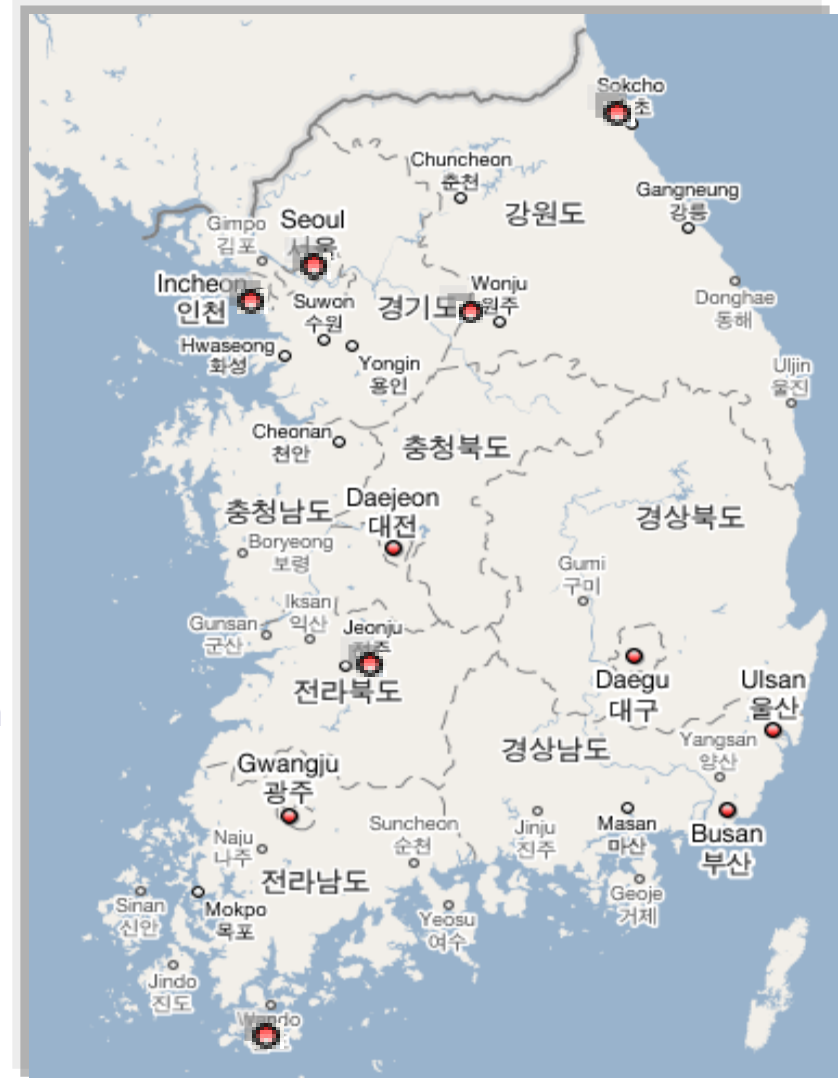


- CIDIN:** Common ICAO Data Interchange Network
- DIR:** Directory Server
- MTA:** Message Transfer Agent
- MTCU:** Message Transfer & Communication Unit (Access Unit)
- MTS:** Message Transfer System

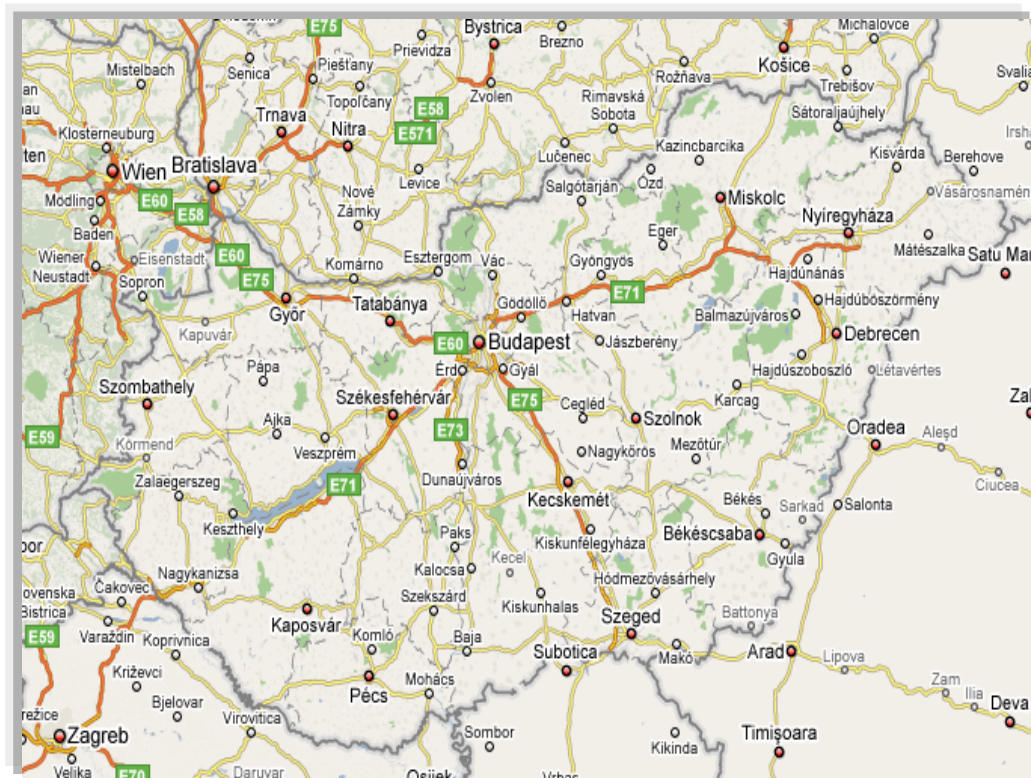


Korean CAA

- International AFTN/AMHS message switch
- AFTN/AMHS Gateway (ICAO SARPs compliance)
- First nation-wide AMHS network with fully ICAO SARPs compliance Integrated UA and AFTN terminals
- Meets High National Security Standards
- Off-the-Shelf Hardware, Standard Software and System-Software components to replace AFTN switch
- Implementation without operational disruption
- High Availability dual HP Unix configuration with additional server for development, maintenance and testing
- Technology Transfer Program
- *In operation since 2002*



- ➔ AMHS/AFTN ICAO COM Center
- ➔ 5 International connections
- ➔ 80 (existing) national AFTN users (asynch.)
- ➔ 4 (existing) ITA-2 (UDC)
- ➔ 50 (new) AFTN Stations (TCP/IP)
- ➔ 50 (new) AviSuite User Agents
- ➔ Stand alone P3
- ➔ https to support roaming users
- ➔ 4 Monitoring and Control Positions (MCP)
- ➔ Successful Performance of AMHS Interoperability Tests acc. EUR AMHS Manual, Appx. E with Austro Control including exchange of File Transfer Body Part-type messages
- ➔ *In operation since 01-Dec-2009*



- AMHS/AFTN ICAO COM Centre
- 4 International connections
- 52 (existing) national AFTN users
- 20 (existing) ITA-2 (UDC)
- 40 (new) AFTN Stations (TCP/IP)
- 4 (new) AMHS UA
- 3 MCP
- TCP/IP router network for new national COM backbone (12 routers)
- AMHS Interoperability Tests with neighbours t.b.d.
- *In operation since 14-Nov-2008*



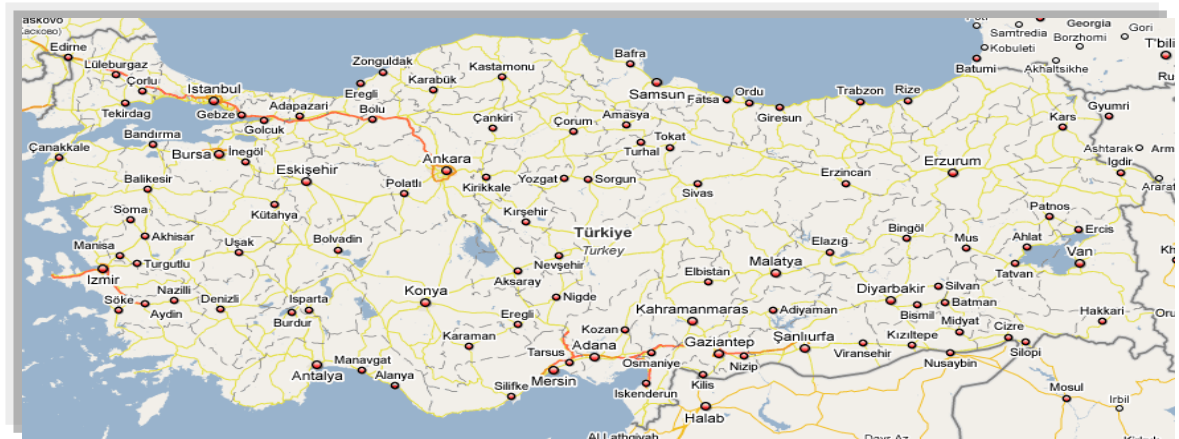
- AMHS/AFTN ICAO COM Centre Amman
- 4 International connections
- ca. 30 (existing) national AFTN users (asynch.)
- 32 (new) AFTN Stations (TCP/IP)
- 32 (new) AMHS User Agents
- 4 Monitoring and Control Positions
- *In operation since 05-Dec-2008*
- Ready for Interoperability Tests with neighbour COM Centres

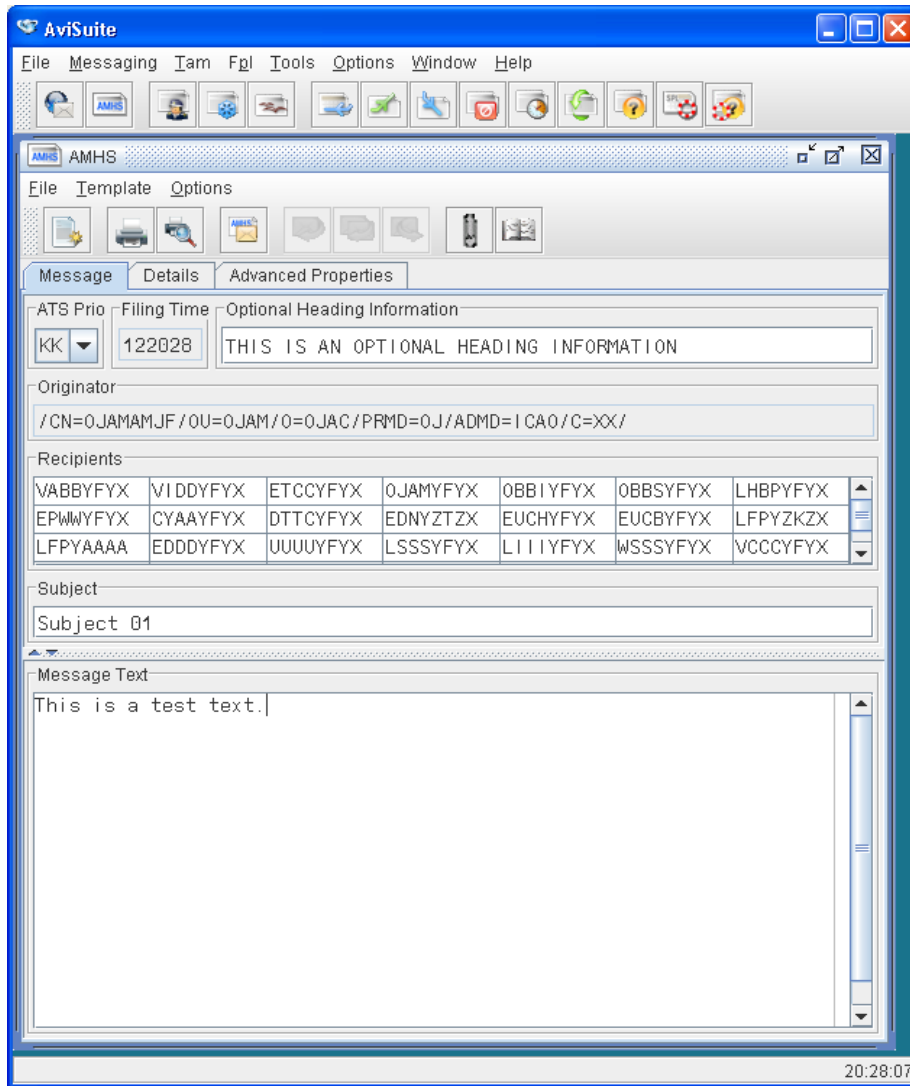


Turkey - Ankara COM Centre LTAC



- AMHS/AFTN/CIDIN Centre in Ankara Esenboga
- Directory Server in Ankara Esenboga
- Flight Plan Database in Ankara Esenboga
- Electronic Flight Strip Display at Adana Airport and Gaziantep Airport
- ca. 250 AFTN Subscribers
- ca. AMHS User Agents
- CIDIN Connections to Athens, Rome, Sofia
- AFTN Connections to Bahrain, Tehran, Ercan (Cyprus)
- *In operation since August 2009*
- Ready for AMHS Interoperability Tests





AviSuite AMHS

File Messaging Tam Fpl Tools Options Window Help

File Template Options

Message Details Advanced Properties

ATS Prio: KK Filing Time: 122028 Optional Heading Information: THIS IS AN OPTIONAL HEADING INFORMATION

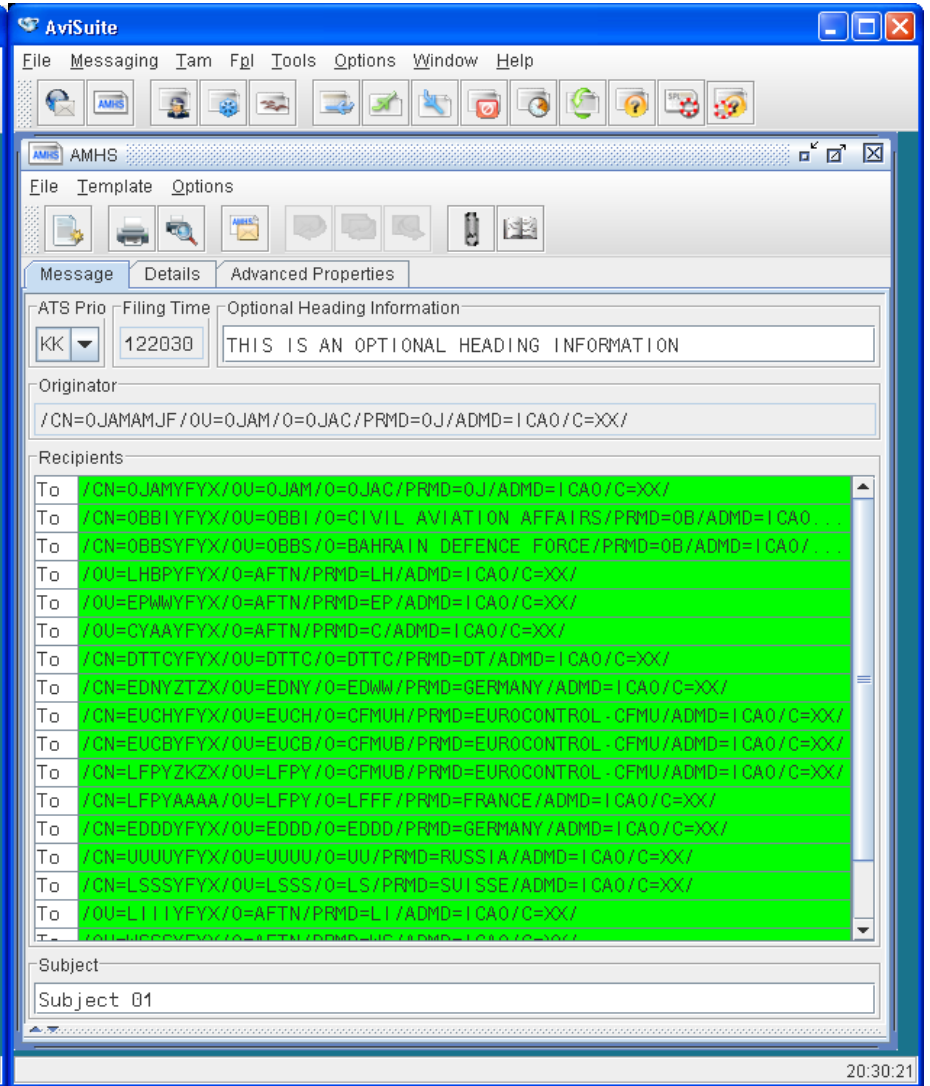
Originator: /CN=0JAMAMJF/OU=0JAM/0=0JAC/PRMD=0J/ADMD=1CA0/C=XX/

VABBYFYX	VIDDYFYX	ETCCYFYX	0JAMYFYX	0BBIYFYX	0BBSYFYX	LHBPYFYX
EPWWYFYX	CYAAYFYX	DTTCYFYX	EDNYZTZX	EUCHYFYX	EUCBYFYX	LFPYZKZX
LFPYAAA	EDDYFYX	UUUYFYX	LSSSYFYX	LIIYFYX	WSSSYFYX	VCCCYFYX

Subject: Subject 01

Message Text: This is a test text.

20:28:07



AviSuite AMHS

File Messaging Tam Fpl Tools Options Window Help

File Template Options

Message Details Advanced Properties

ATS Prio: KK Filing Time: 122030 Optional Heading Information: THIS IS AN OPTIONAL HEADING INFORMATION

Originator: /CN=0JAMAMJF/OU=0JAM/0=0JAC/PRMD=0J/ADMD=1CA0/C=XX/

Recipients:

- To: /CN=0JAMYFYX/OU=0JAM/0=0JAC/PRMD=0J/ADMD=1CA0/C=XX/
- To: /CN=0BBIYFYX/OU=0BBI/0=CIVIL AVIATION AFFAIRS/PRMD=0B/ADMD=1CA0/...
- To: /CN=0BBSYFYX/OU=0BBS/0=BAHRAIN DEFENCE FORCE/PRMD=0B/ADMD=1CA0/...
- To: /OU=LHBPYFYX/0=AFTN/PRMD=LH/ADMD=1CA0/C=XX/
- To: /OU=EPWWYFYX/0=AFTN/PRMD=EP/ADMD=1CA0/C=XX/
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- To: /CN=EUCHYFYX/OU=EUCH/0=CFMUH/PRMD=EUROCONTROL - CFMU/ADMD=1CA0/C=XX/
- To: /CN=EUCBYFYX/OU=EUCB/0=CFMUB/PRMD=EUROCONTROL - CFMU/ADMD=1CA0/C=XX/
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- To: /CN=LIIYFYX/0=AFTN/PRMD=LI/ADMD=1CA0/C=XX/

Subject: Subject 01

20:30:21

- Avitech are a systems solutions company using all MHS technologies for complex requirements.
- Avitech offer common user terminals for AMHS AFTN and AIS functionality.
- Avitech deliver systems that are ready for pre operational testing with neighbours.
- All systems conform to ICAO requirements and have been tested to comply in accordance with those requirements and have no interoperability issues with other compliant solutions.
- This has been proven conclusively by successful interoperability testing that has already taken place.