



# ICAO Message Handling Systems

## ICAO MHS Networks

ICAO has established Standards and Recommended Practices that require all contracting states to provide and support the Aeronautical Fixed Service (AFS). For decades the Aeronautical Fixed Telecommunication Network (AFTN) and, in the EUR/NAT and the MID Regions, the X.25 based Common ICAO Data Interchange Network (CIDIN) have been used for the exchange of aeronautical messages. Due to certain limitations concerning the message format and the need to transport binary encoded data ICAO has strongly encouraged the introduction of ATS Message Handling Systems (AMHS).

AviSuite's modular design is scalable to build small to large and high-availability COM Centres. Single and multi switch systems including network solutions are configurable.

The following switch variants are available:

- AFTN switch
- AFTN/CIDIN switch
- Integrated AFTN/AMHS switch with gateway functionality
- Integrated AFTN/CIDIN/AMHS switch with gateway functionality

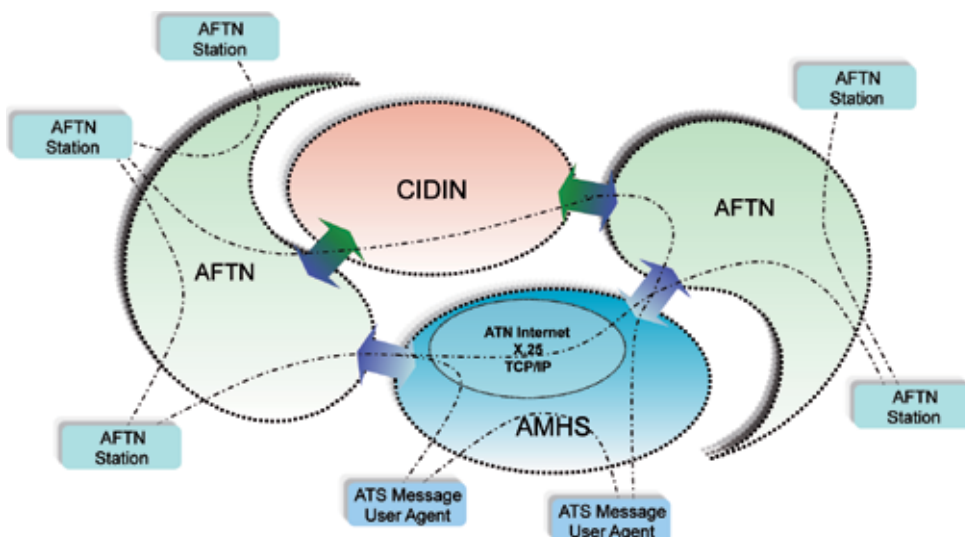
All variants include a Store and Forward Module (SFM) supporting message retrieval and repetition functions and ensuring zero message loss in case of system restart.

In addition to these server switching components AviSuite also offers end-user client applications:

- AFTN User Agent
- AMHS User Agent

## AFTN Component

The AviSuite AFTN Component provides the functionality of an AFTN COM Centre strictly conformant to ICAO Annex 10, Vol. II, Amendment 85. It facilitates routing and relaying of messages with multiple addressee indicators, including Predetermined Distribution Addressee Indicators (PDAI) and Multi Circuit Distribution. It supports asynchronous lines, TCP/IP, X.25, X.29, TCP/IP, dial-in/dial-out connections via PSTN and FAX connections. Both IA5 and ITA-2 message formats can be used. The maximum message text length can be configured up to 64,000 characters. AFTN service messages are configurable to be processed and generated automatically or upon operator action.



## AviSuite MHS Overview

Avitech's AviSuite MHS Overview product family supports AMHS, AFTN and CIDIN and provides an AFTN/AMHS gateway, thus ensuring interoperability between the AFTN/CIDIN and the AMHS networks.



## AFTN/AMHS User Agents

Both the AFTN and the AMHS User Agent are advanced messaging clients meeting the needs of ATS users. The applications combine the convenience of a highly sophisticated ATS terminal application with the message handling capabilities of AFTN or AMHS depending on the customers' requirements.

The entry point for all messaging related data in AviTerm is the Message Office. It is used to collect all messages submitted and received by the messaging AviUnit. Its HMI is split into three sub windows, a tree view, a table view and message preview – similar to the view presented by most of the popular email clients.

A message can be previewed by selecting it in the table view.

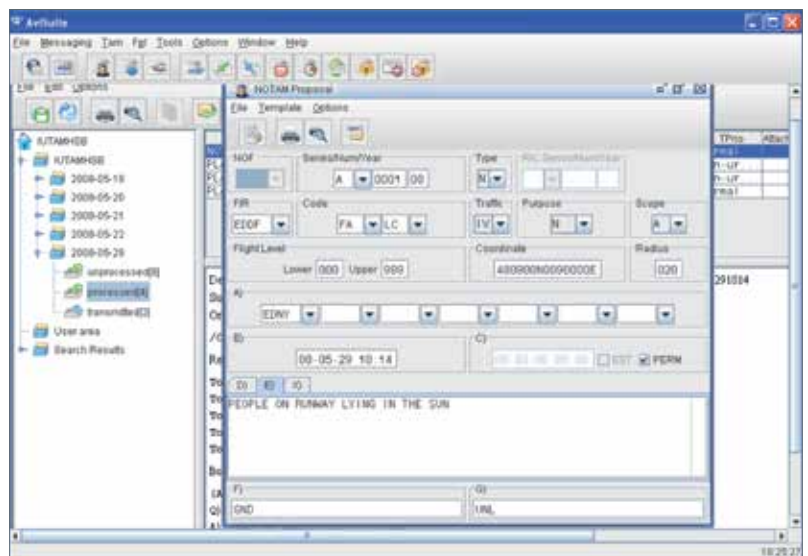
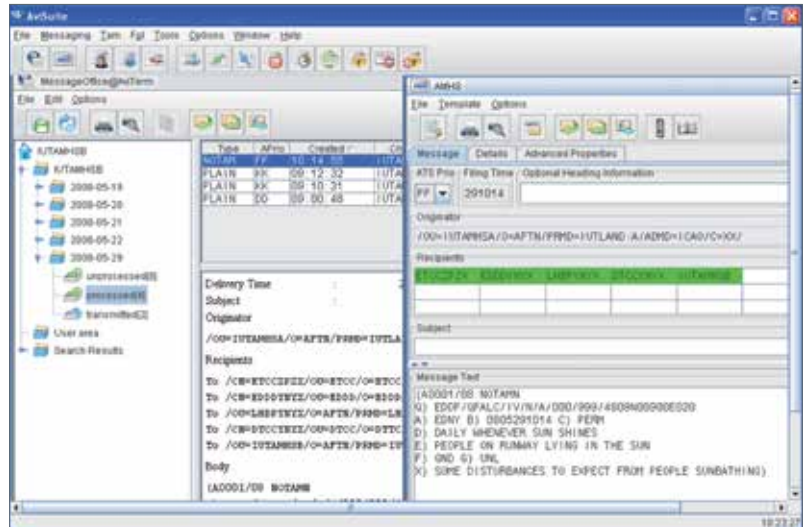
In order to see all details of the message, it can be opened in the specialized AviUnit.

If a received message contains information elements that require the immediate attention of the user, an audible and visible alarm is generated notifying the user of the relevant event.

A new message can be created using different methods. The simplest method is filling in all necessary data into the input fields of the according application window. To compile new messages, the user may also load an existing message for modification. All AviUnits implement a common template handling mechanism allowing the creation, storage and administration of message templates. In centralised installations, templates may even be shared amongst the user community.

The software comprises comprehensive syntactical and, wherever possible semantic checks of the data entered by the user. This ensures a high quality of all messages submitted.

A specialized frame for AFTN messages supports all necessary AFTN specific features according to ICAO Annex 10, Vol. II.



In order to ease the migration from AFTN to AMHS, the AMHS frame is structured in so that users accustomed to AFTN quickly feel at home.

The integrated functionality of a Directory User Agent (DUA) automatically handles the conversion of AFTN addresses into AMHS addresses and vice versa. This ensures that addresses are always consistent and reduces the risk of delivery failure due to mistyped AMHS addresses.

The AMHS User Agent can be connected to an ATS Message Server either by means of the MTS Access Protocol P3 or the MS Access Protocol P7.

In addition to the Basic ATS Message Handling Service the AMHS User Agent supports the following Extended Services:

- ➔ ATN/AMHS Directory Services
- ➔ Support of Unstructured Binary Data (File Transfer Body Part)
- ➔ Use of IPM Heading Extensions
- ➔ Security Services

## Options

Avitech also furnishes AFTN and/or AMHS P3 or P7 protocol interfaces to legacy systems in order to connect them to an AFTN or AMHS switch.

An AFTN/IATA-Type B gateway can be integrated into the AviSuite switch.

An ATN Router can be provided, if AMHS communication via the ATN Internet is required.

## Conformance

AviSuite fully conforms to the recommendations and requirements of

- ICAO Annex 10, Vol. II, Amendment 85
- ICAO EUR Doc 005 – EUR CIDIN Manual, 6th edition
- ICAO Doc 9880 – AN/466, Part II, First Edition – 2010
- ICAO EUR Doc 020 – EUR AMHS Manual, Version 6.0
- ICAO EUR Doc 021 – ATS Messaging Management Manual, Version 7.0
- EUROCONTROL Specification on the Air Traffic Services Message Handling System (AMHS), Edition 2.0

AMHS Conformance Tests as specified in Appendix D of the EUR AMHS Manual have been successfully performed with several customer systems supplied by Avitech.

## Experience, Technology Leadership, References

Avitech's experience in aeronautical data and message switching traces back to the 1970's when the first Message Handling System went into operation. Avitech's technology leadership was established in 1992 with the start of operational use of the world's first CIDIN link. In 1996 Avitech implemented an integrated AFTN/CIDIN/AMHS system with the first nationwide AMHS network for the combined German Armed Forces. This system comprises 31 MTAs in different locations in Germany. After several upgrades it is fully compliant to ICAO Doc 9880, Part II. Having successfully passed all conformance, interoperability and pre-operational tests defined in ICAO EUR Doc 020 – EUR AMHS Manual, Appendices D, E, F, the system exchanges operational AMHS traffic with the German Civil COM Centre since February 2011.

The integrated AviSuite AFTN/AMHS system in Jordan was among the first to establish international AMHS links for operational use. Since 2010 three operational AMHS links between Amman and other COM Centres in the MID Region have proven their reliability and stability.

Further AviSuite AFTN/AMHS switches are in operation in South Korea, Tunisia, Turkey, Hungary and Poland.

Avitech actively participated in the **FIRST** (First Multipartite International Realisation of ICAO SARPs AMHS Trials) group in which 3 independent ANSPs and their suppliers defined and validated interoperability tests which were later appended to the EUR AMHS Manual.

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