AERONAUTICAL TELECOMMUNICATION NETWORK PANEL

WORKING GROUP 3 (APPLICATIONS AND UPPER LAYERS)

Phuket, THAILAND, 4 - 6 March 1997

VALIDATION RESULTS FOR THE TYPE A GATEWAY SARPS

Prepared by: James Moulton

Presented by: James Moulton

SUMMARY

This document presents details on the FAA sponsored validation of the Type A Gateway SARPs.

1. Introduction

The FAA is sponsoring the implementation and testing of the Type A Gateway SARPs for the purpose of validation the technical specifications.   This paper describes the implementation and testing of the Type A Gateway SARPs.

2. Background

The Type A Gateway was implemented using the already tested ULCS software and commercial lower layers. The implementation was based on the post-Montreal ATNP/2 specifications and included all functions in the Type A Gateway SARPs.

3. Implementation Architecture

The ONS implementations operate on the Sun Solaris system. The OSI communication software and X.25 software are standard SunLink products and not ATN compliant. The applications operate over the ONS Upper Layer Communication System (ULCS) that implements the Dialogue Service, ACSE, fast byte Presentation Layer, and fast byte Session Layer. The ONS ULCS is compliant with the draft ULCS SARPs as approved at the Montreal ANTP/2 meeting.

All implementations of the air - ground applications are based on the SARPs documents presented as the output of the Montreal ATNP/2 meeting.

4. Current Status

At the present time, ONS has completed the implementation of the Type A Gateway application and has completed local "loop-back" testing.

5. Validation Objectives

The following sections detail the mapping of shall statements to implementation testing.

In the following table, the colums represent:

- VO = validation objective
- Impl = Whether implemented
- VM = How validation was achieved (I= implemented and tested)

REQID	SARPs Reference	Requirement Text	VO	Impl	VM
	3.1.3.2.1	The AFTN component shall handle the interface to the AFTN and provide an interface to the Message Transfer and Control Unit.		√	I
	3.1.3.3.1.2	The AFTN component shall implement: a) all the applicable requirements of Annex 10, Volume II, in a manner so as to be indistinguishable from an operational AFTN station by the AFTN Centre to which the gateway is connected; and b) additional requirements which are not placed on AFTN stations by Annex 10, Volume II but which are necessary due to the AFTN Component requirements pertaining to an AFTN/ATN Type A Gateway		√	D
		The AFTN component shall incorporate an AFTN procedure handler that provides all of the AFTN functions prescribed for the interface to the AFTN.		√	D
		. The AFTN Component shall isolate all AFTN procedures from the Message Transfer and Control Unit Component.		√	I
		The AFTN Component of an AFTN/ATN Type A Gateway shall perform short term retention of all messages transmitted towards the AFTN in a manner equivalent to that specified for an AFTN communication centre in Annex 10, Volume II, 4.4.1.7 to provide recovery from communication protocol errors.		√	I
		The AFTN Component shall perform long-term retention of all AFTN messages, in their entirety, that it generates, for a period of at least thirty days.		√	I
		The AFTN Component shall perform long-term retention of the heading, address and origin parts of all messages received from the Message Transfer and Control Unit and the action taken thereon, for a period of at least thirty days.		√	D
		The ATN Component shall implement the procedures required of an ATN End System as specified by the ATS Message protocol stack Type A.		√	I

				√	I
		The ATN Component service shall consist of a single service primitive between it and the Message Transfer and Control Unit, the GA-Data request and indication		√	I
		The User Data parameter shall contain the IA5 form of a complete AFTN message, as defined in Annex 10, Volume II.		√	I
		The Called Address parameter shall contain the ATN-end system id of the destination AFTN/ATN Type A Gateway consisting of the ICAO 8-character facility designator as defined in 4.		√	I
		The Calling Address parameter shall contain the ATN-end system id of the AFTN/ATN Type A Gateway consisting of the ICAO 8-character facility designator as defined in 4.		√	I
		The AFTN Priority parameter, if present, shall contain the AFTN priority indicator of the AFTN message, as defined in Annex 10, Volume II.		√	I

		. The ATS Message protocol stack Type A shall consist of protocols and procedures specified in 4, and consisting of:
		
		a) the ATN Component Control Function, which incorporates the Control Function of the Upper Layer Communication Service as specified in 4.3.3 and the additional provisions specified in 3.1.3.3.2.4;
		b) the Dialogue Service as specified in 4.2, consisting of:
		    1) the Association Control Service Element,
		    2) the Presentation Efficiency enhancements, and
		    3) the Session Efficiency enhancements;
		c) the Application Level Naming and Context Definition as specified in 4.3.2; and
		
		d) the ATN Communication Services requirements as specified in 5.
				√	I

		The ATN Component Control Function (CF) shall map the GA-Data requests		√	I

		and indications to and from the Dialogue Service as specified in 4.			
		Upon receipt of a GA-Data request, the CF shall determine if a dialogue exists with the destination ATN End-System by examining the Called Address parameter.		√	I
		If a dialogue does not exist, the CF shall formulate a D-START-request primitive.		√	I
		The parameters of the D-START-request shall be set according to Table 3.1.3-2.		√	I
		Upon receipt of a D-START-indication, the CF shall determine if the parameters are valid according to Table 3.1.3-2.		√	I
		If the parameters received in a D-START-indication are acceptable and sufficient resources available to support the association, the CF shall accept the association by sending a D-START-response, in which the parameters are set according to Table 3.1.3-3 with the Result parameter set to the abstract-value "accepted".		√	I
		If the parameters received in a D-START-indication are unacceptable or there are insufficient resources available to support the association, the CF shall reject the association by sending an D-START-response, in which the parameters are set according to Table 3.1.3-3, with the Result parameter set to the abstract-value "rejected (permanent)" in the case of invalid parameters and set to the abstract-value "rejected (transient)" if there are insufficient resources.		√	I
		Upon the completion of the dialogue set-up, or in the case of using an existing dialogue, the CF shall formulate a D-DATA request by taking the data in the User Data parameter in the GA-Data-request and encoding it as the user data field in the D-DATA-request.		√	I
		The data received in the User Data parameter of the GA-Data-request is the complete AFTN message, which shall be passed transparently to the destination system		√	I

				√	I
		Upon the receipt of a D-DATA-indication, the CF shall extract the user data and place it in the User Data parameter of the GA-Data-indication		√	I
		If the CF does not have any data to send over a dialogue for a time period t_1, it shall release the dialogue by formulating an D-END-request.		√	I
		The parameters of the D-END-request shall be set according to Table 3.1.3-4.		√	I
		Upon receiving an D-END-indication, the CF shall release the dialogue as soon as it no longer has any data to send (over that dialogue) by formulating a D-END-response.		√	I
		The parameters of the D-END-response shall be set according to Table 3.1.3-5.		√	I
		For immediate termination of the dialogue, the D-ABORT-request parameters shall be set according to Table 3.1.3-6.		√	I
		For immediate termination of the dialogue, the D-ABORT-request parameters shall be set according to Table 3.1.3-6.		√	I
		For immediate termination of the dialogue, the D-ABORT-request parameters shall be set according to Table 3.1.3-6.		√	I
		For transmission of messages across the ATN, the AFTN priority indicators, as found in Annex 10, Sub-Volume II, 4.4.1.2, shall map to Dialogue Service QoS (Priorities) in accordance with Table 3.1.3-7.		√	I
		The ATN component shall process incoming and outgoing messages according to the priority of the message.		√	I
		The Message Transfer and Control Unit of an AFTN/ATN Type A Gateway shall log all messages and information related to the following events that have occurred at its interfaces with the ATN Component and with the AFTN Component, and in its internal procedures:		√	I

		a) the messages transferred out (to the ATN Component); b) the messages transferred in (from the ATN Component); c) the AFTN messages conveyed out (to the AFTN Component); d) the AFTN messages conveyed in (from the AFTN Component); e) the AFTN service messages indicating unknown addressee indicator conveyed out (to the AFTN Component).			
		The Message Transfer and Control Unit Component shall maintain an address mapping function which maps between an AFTN addressee indicator and the ATN address of the AFTN/ATN Type A Gateway via which the addressee may be reached.		√	I
		The address mapping function shall, at a minimum, provide the following mappings: a) a map from an entire AFTN address to an ATN address, b) a map from sets of AFTN addresses based on a portion of the AFTN address to a single ATN address.		√	I
		Upon the reception by the Message Transfer and Control Unit of a message passed from the AFTN Component, it shall examine the AFTN Address Indicators to determine the onward routing requirements of the message over the ATN Internet.		√	I
		Prior to delivery of the message to the ATN Component, the Message Transfer and Control Unit Component shall apply the address stripping procedures defined in Annex 10, Volume II, 4.4.8 to omit from the address any AFTN Address Indicators not related to the selected ATN address and provide for message replication if more than one ATN address is required.		√	I
		The Message Transfer and Control Unit shall send an appropriate service message to the AFTN originator indicator advising of an unknown address indicator according to the following:		√	I

		a) the abbreviation SVC, b) the procedure signal ADS, c) the alignment function, d) the indication UNKNOWN, e) the unknown address indicator(s), f) the end-of-text signal.			
		Upon the reception by the Message Transfer and Control Unit of a GA-Data-Indication passed from the ATN Component, the message shall be extracted from the User Data parameter		√	I
		The extracted message shall be passed unmodified to the AFTN Component.		√	I
		The interface between the ATN Component and the Message Control Unit Component shall be according to the ATN Component service as specified in 3.1.3.3.2.2.		√	I
		To send an AFTN message across the ATN, the Message Transfer and Control Unit Component shall invoke a GA-Data-request primitive to the ATN Component.		√	I
		The called address parameter in the GA-Data-request shall be the ICAO facility designator of the destination AFTN/ATN Type A Gateway.		√	I
		The calling address parameter is optional in the GA-Data-request and shall be the local ICAO facility designator of the AFTN/ATN Type A Gateway, if provided.		√	I
		The AFTN priority parameter in the GA-Data-request shall be set according to the value of the AFTN priority indicator of the message.		√	I
		Upon receipt of a D-DATA-indication primitive, the ATN Component shall invoke a GA-Data-indication to the Message Transfer and Control Unit Component.		√	I

				√	I
		The AFTN message, as found in the User Data parameter of the D-DATA-indication, shall comprise the User Data parameter of the GA-Data-indication.		√	I
		The calling address parameter in the GA-Data-indication shall be the ICAO facility designator of the AFTN/ATN Type A Gateway which initiated the GA-Data-request.		√	I
		The AFTN priority parameter, if present in the GA-Data-indication, shall be derived, using Table 3.1.3-7, from the value of the QoS (priority) parameter of the corresponding D-START-indication.		√	I
		All AFTN messages or service messages passed by the AFTN Component to the Message Transfer and Control Unit shall be transferred in the order received.		√	I
		An AFTN message or service message passed by the Message Transfer and Control Unit to the AFTN Component shall be transferred in the order received.		√	I