

AERONAUTICAL TELECOMMUNICATIONS NETWORK PANEL

WORKING GROUP 3 MEETING

Phuket, Thailand, 4 - 6 March 1997

Agenda Item 7: DRAFT GUIDANCE MATERIAL

7.1 SUB-VOLUME 2

Presented by M J A Asbury

1. INTRODUCTION

1.1 Until ATNP/2 preparation of the Air/ground applications SARPs had precluded any work being done on Guidance Material for these applications. Since then, a considerable amount of work has been done - this short paper presents the results to date.

2. FORMAT

2.1 At the 11th meeting of Sub-Group 2 at Bracknell in December 1996, an outline plan for the GM was developed, based to an extent on the concept that 'What was implicit in SARPS should be explicit in the GM'.

2.2 As with the Air/ground SARPs, all the GM will be written to a common template, where possible. In addition, the documents will be 'Stand-alone', with, for example, their own glossaries and explanations of terms. In this way, the SG will aim at providing user-friendliness, and independent readability, to an extent educating the implementer concerning the meaning and intent behind the rigid and arcane language of the SARPs themselves.

2.3 Appendix A outlines the template against which the GM will be produced. In the expansion of some ideas, the CM Logon function has been chosen, principally because it will generally be the starting point for all normal operations.

2.4 There will inevitably be some repetition of existing SARPs material, put into simpler words. However, there will be caveats in the GM to indicate that this is just for guidance, and the SARPs themselves remain at all times the ultimate technical authority.

3. FUTURE WORK

3.1 It is envisaged that work will continue on the production of the material with the objective of producing draft final guidance material for a WG 3/WGW meeting at the end of 1997.

EXPANDED EXAMPLE OF GM FORMAT

AVOID OPERATIONAL PROCEDURES

1. INTRODUCTION

(GM to help implementers - not a handbook (No need to explain the whole ATN concept))

Reasons for GM (generic)

Scope, Purpose and Structure of the document (generic)

Brief overview of application

Inter-relationship of applications (CM operational dependency (address exchange and version negotiation performed on behalf of the applications), technical independence (individually certifiable), ground/ground and air-ground distinction)

SARPs Chapter overview (generic)

References (ADSP Manual, ULA, RTCA?, ISO?)

2 OVERALL GENERAL FUNCTIONALITY

(Concepts / Black Box approach (specific))

ASE diagram (ASE instances)

Explanatory on dialogue opening/closing (keep alive...)

One shot CMA (or small FIR problems)

Number of contracts, number of remote systems (4 ATCC / aircraft)

Overview of progress

Rational for user/system functionality (generic)

Scope of the SARPs - definition of upper and lower bounds (End users identification (human))

ATIS/CM server system (centralised)

Ground Distribution of FIS/CM information

Comparison of air and ground functionalities

Lack

Multiplexing of ADS/FIS contracts over dialogue

Addressing (CM): data base, initial ground CM address must be available, impact on the ground topology (one application of a type by CM area)

etc...

3 FUNCTIONALITY BASED OR SERVICE BASED

3.1 CM Logon

very high level description of the purpose of the function and when used + negatives - sequence of primitives/actions performed by users, ASEs and DSP.

... compilation...

... derivation data base... (???)

... implementation...

CM Update

CM Contact

CM Forward

CM User Abort

CM Provider Abort

(SAMPLE EXPLODED FUNCTION

3. **FUNCTIONALITY/SERVICE BASED**

3.1 Logon

i. Very high level description of purpose of function, and when used, including negatives - i.e. where not used. Mention that this logon is only related to the Application Level.

Followed by sequence of events and explanation, thus -

- a. Pilot/System initiates logon*
- b. Selects addresses to send to ground.*
- c. CM logon required*
- d. ASE assembles PDU and invokes D-START request*
- e. On ground D-Start Indication occurs*
- f. ASE passes info to CM user*
- g. CM user stores info (possibly correlating with FDPS)*
- h. CM-user obtains addressing info to return*
- i. CM user invokes D-START response*

This may accept or reject D Start.)

4 **CHAPTER BASED**

Chapter 2

Error Handling

Chapter 3

What is an "abstract service"

U/M, why U, M, C (cell contents), two tables

Table content, format: destination/source of the data (D service, ASN.1) (generic)

ASN.1 versus abstract values

Chapter 4

Encoding/Decoding rules

Glossary from ADSP expanded

Extensibility

Chapter 5

Explain MSDs

Explain derivation of technical timers (as opposed to operational)

State table detail (not permitted/can not occur)

Cross over situation explanation

FIS/ADS Module explanation

Statement ordering may matter

Text takes precedence over state table

Chapter 6

PER - choice and implementation

QOS priority: where it comes from (ADSP), how they relate to other application, use by the ATN (in case of congestion), benefits and effects

QOS RER High/low explanation

CO versus CL

Chapter 7

Justify chapter 7. Chapters 3 and 5 guarantee interoperability but not operational acceptability (use of service primitives, use of optional ASN.1 data, required relationships between parameters in the request and in the response (e.g. ATIS report when FIS demand report contains ATIS, definition of event for ADS,...)).

Range and Resolution - from Manual - Distance units.

Answers to some "whys". Stand alone Elements (justify rules beyond the ADSP instructions)

What is conveyed in a CPDLC message.

Messages inserted / ordered to preserve an element of compatibility with previous systems.

Chapter 8

Any ground configuration works with any air configuration

A system will implement a configuration at a time

No correlation between version number and configuration

ASE implementation drives configuration

"Do not use" options specify predicates

5 DIMENSIONS (SIZE OF MESSAGES)

Largest message and APDU size + justification of upper bounds

Practicability

Current/future limitation (airborne calculations, air/ground sub-networks, COTS limitations...)

Operational use (capacity, timings, ...)

Commercial considerations

Reasonable implementation. Real number given.(what happens if sender sends a message too big for the receiver to handle).

Max usable size - TBD (consult with CAA's). Is a 'shall' statement required in SARPs ?

Rate of (ADS/CPDLC) messages

Number of (ADS) connections (both ways)

Number of (ADS/FIS) contract in parallel

6 INDEXES / TABLES

ASN.1 index (cf. CPDLC example)

7 EXAMPLE SCENARIOS (CHAPTER 7)

User level scenarios:

CPDLC: LACK, DSC, NDA

ADS/FIS: each type of contracts

8 EXAMPLE ENCODING

Based on examples from Norman Goodacre, Fred. Picard or SG3.