

January 24, 2008

Report of the DLK **Teleconference 5** held on **17 January 2008**

In attendance were:

Andrew Onken, ARINC	Tom Mustach, FAA
Stephane Pelleschi, DSNA	Therin Dastrup, Honeywell
Augustin Gheorghe, Eurocontrol	Tom McGuffin, Honeywell
Olivier Gremillet, Eurocontrol	Mike Russo, IA Staff
Isabel Herail, Eurocontrol	Rob Morgenstern, MITRE
Nick Witt, Eurocontrol	Jim Scroggs, Rockwell Collins
Peter Muraca, FAA	Alain Bothorel, Rockwell Collins France

**Introduction**

DLK Systems SC Secretary Mike Russo moderated a teleconference concerning the development of an AEEC Standard for ARINC 631. This teleconference was held from 1500 - 1745 UTC.

**Agenda – DLK Sys Telecon 4, 20 December 2007**

1	Admin – Reports and Action Items	
2	Review Working Papers	
3	Review Chapter 4 of A631	
4	Review Chapter 9 of A631	
5	Close – Revisit Action Items	

**1] Administrative**

Mike Russo conducted a brief review of the previous DLK telecon (Telecon 4) held on 20 December 2007. Alain Bothorel noted that Frederic Durand had presented a case against making the FSL technique mandatory, contrary to the report, which stated his objection to a mandatory Autotune feature. This correction has been made to the report.

The objective was for DLK Telecon 5 to continue the dialogue on the proposals for (1) autotune and (2) retuning based on the presence of entries in the FSL.

## 2] Eurocontrol Working Paper

Mike introduced a working paper by Nick Witt that offered proposed text for Section 4.3.1.1, pertaining to Disconnecting Old Link (Autotune Parameter Not Used). Nick's text was incorporated as submitted. "Both stations should preferentially use the new link once it has been created, and should retain the old link until TG5 expiration, after which each will consider the link disconnected without sending or receiving a DISC." Nick's proposal for the subsequent commentary was also accepted as proposed. "Following a transfer of an Autotune Parameter, the aircraft will generally attempt to create a new link on a different frequency, and thus it will no longer be possible to transfer messages on the old link. Under such circumstances, disconnection of the old link following TG5 expiry is intended to provide commonality of procedure over all handoff scenarios, thus easing implementation and integration with other entities such as the ATN."

In an ATN environment, it is possible that the old and new links are connected through different ATN Routers. The ATN protocol would preserve the route via the old link until TG5 expires, and might attempt to use it, depending on the local topology. Nick's submission also contained a recommendation for text to be inserted the third paragraph of section 9.8.1, Autotune. "If the ground VME receives a request to establish a third link with the aircraft it should honor the request. If a link establishment request is addressed to a VGS already having a link with the aircraft, any existing link between the stations should be disconnected silently on the aircraft and at the VGS."

There is a residual problem. When an attempted autotune fails because the ground fails to recognize the downlink XID\_CMD\_HO, and the aircraft eventually reverts to the CSC and performs a link establishment. In this case no TG5 timers are started. So, the old link will be maintained for a considerable period of time. Consensus of the telecom was to attempt to develop a text to be added to ARINC 631 to lead to the orderly closure of the old link. Nick's paper is included as Attachment 2 to this report.

## 3] Chapter 4

Mike let a review of the latest changes to Chapter 4 with an emphasis on Section 4.3.1.1.

## 4] Chapter 9

Mike let a review of the latest changes to Chapter 4 with an emphasis on Section 9.8.1. Action items were given to cover more scenarios and to be more specific. Also, there should be additional message sequence diagrams. There should be a PICs entry to specify mandatory **aircraft** support for the FSL.

Consensus of the telecon was that aircraft in the air (en-route) that connected with a terminal ground router on the ground frequency could reduce their capacity by inadvertently increasing traffic. The telecon recognized that there will inevitably be a mixed population (in terms of capability) with some aircraft being incapable of recognizing the air/ground bit in the GSIF. There was no conclusion as to whether it would be necessary for DSPs to reject requests for link connection from these en-route aircraft. Further research is needed.

**5] DLK Telecon 6**

DLK Telecon 6 will be held on 7 February 2008 at 15:00 UTC (10:00 am Eastern Standard Time). There are residual concerns

This report was prepared by Mike Russo.

ATTACHMENT 1

Actions Items from Telecon 5 of DLK Systems Subcommittee held 17 January 2008					
<u>Number*</u>	<u>Volunteer</u>	<u>Organization</u>	<u>Action Description</u>	<u>Status</u>	<u>Due</u>
08-01_03	Nick Witt	Eurocontrol	1) Submit changes to add PICS entry for mandatory FSL		
08-01_02	<a href="#">Pete Muraca</a>	<a href="#">FAA</a>	2) <a href="#">Develop additional message sequence charts to Appendix H.</a>	Open	
08-01_01	Nick Witt	Eurocontrol	1) Develop text to cover additional scenarios and increase the level of detail in Section 4.3.1.1 concerning. [Andrew Onken will coordinate. 2) Provide draft text on how the DSPs should treat access to terminal frequency when the aircraft is airborne (e.g., en-route) overflying the airport.	Open	

Actions Items from Telecon 4 of DLK Systems Subcommittee held 20 December 2007					
<u>Number*</u>	<u>Volunteer</u>	<u>Organization</u>	<u>Action Description</u>	<u>Status</u>	<u>Due</u>
07-12_02	Mike Russo	IA Staff	3) Modify references to ICAO SARPs VDL Manual from Section 6.5.--- to Part 2 Section 5.--- 4) Clean up Chapters 4 & 9 for review at Telecon 5	Open	
07-12_01	Nick Witt	Eurocontrol	3) Provide proposed revisions for commentary to Section 4.3.1 and in Section 9.8 concerning link establishment to an existing frequency. 4) Add informal descriptive text as an appendix to describe how the FSL process behaves.	Open	

Actions Items from the Meeting of DLK Systems Subcommittee held October 23-25, 2007 in Dallas, TX					
<u>Number*</u>	<u>Volunteer</u>	<u>Organization</u>	<u>Action Description</u>	<u>Status</u>	<u>Due</u>

## ATTACHMENT 1

07-10_07	Tom McGuffin	Honeywell	Develop new text for ARINC 618 that expresses the airline's desire that new DSP frequencies avoid the pre-existing frequency assignments of other DSPs, particularly their base frequency.	Open	
07-10_06	Alexandre Simonin <b>and Nick Witt</b>	Eurocontrol	Provide proposed revisions to the VSDA address to specify a single address. Changes impact the body of the text plus Appendix D. MPR to provide diagrams.	Open	
07-10_05	Tom McGuffin	Honeywell	Update Appendix H for Draft 3 of Supplement 6 to ARINC 631: <b>Modify Message Sequence Charts.</b>	Open	
07-10_04	Alexandre Simonin	Eurocontrol	Submit an overview of the frequency management process and update Attachment 2 or ARINC 631.	Open	
07-10_03	Alain Bothorel	Rockwell Collins France	Prepare descriptions of the avionics use of FSL contents (random/sequential/CSC fallback/all) and the use of an ordered list.	<b>Closed</b> <b>12/5/07</b>	
07-10_02	Rob Morgenstern	MITRE	Inform ICAO that the SARPs use of the term "ground command" is confusing. The SARPs and VDL Tech Manual should be edited to remove inconsistencies.	Open	
07-10_01	Rob Morgenstern	MITRE	Research the applicability of Airport Coverage Indication (See Table 2-2-9 of Attachment 2 to ARINC 631) to ensure that there is no conflict with the SARPs.	<b>Closed</b>	

## ATTACHMENT 2

**From:** Nicholas Witt [mailto:n.witt@nwc.u-net.com]  
**Sent:** Wednesday, January 16, 2008 5:10 AM  
**To:** Russo, Michael (MPR)  
**Cc:** Augustin Gheorghe; Joerg Steinleitner (Steinleitner\_Joerg); Martin Adnams (Adnams\_Martin); Patrick Delhaise (Delhaise\_Patrick); Alexandre Simonin; Isabelle Herail (Herail\_Isabelle)  
**Subject:** RE: [DLK] DLK Telecon 5 Wkg Papers

Mike,

At the last telecon, I undertook to propose a couple of items of text relating to the autotune provisions in draft Supp 5 to ARINC 631. In addition, I have also reviewed the surrounding text, and generated a few additional comments. I would be grateful if you would forward this to the normal distribution list in readiness for the telecon.

First of all, in section, 4.3.1.1, I believe that the current text under the heading "Disconnecting Old Link (Autotune Parameter Not Used)" is confusing, and doesn't accurately reflect the desired behaviour. I would propose that the final sentence is replaced by:

"Both stations should preferentially use the new link once it has been created, and should retain the old link until TG5 expiration, after which each will consider the link disconnected without sending or receiving a DISC."

For the subsequent Commentary, based on the discussion last telecon I suggest:

"Following a transfer of an Autotune Parameter, the aircraft will generally attempt to create a new link on a different frequency, and thus it will no longer be possible to transfer messages on the old link. Under such circumstances, disconnection of the old link following TG5 expiry is intended to provide commonality of procedure over all handoff scenarios, thus easing implementation and integration with other entities such as the ATN."

However, this does raise a further issue concerned with ATN routing, which is that if the old and new links are connected through different ATN Routers (quite possible), the ATN would preserve the route via the old link until TG5 expires, and might attempt to use it, depending on the local topology. Since this ATN route would only lead to a black hole, any attempted use would be very undesirable. The precedence of ATN routes at VDL handoff is a recognised issue, which we have encountered in LINK 2000+, but the autotune scenario elevates its significance, and requires a robust solution. I propose that Eurocontrol keeps this under review and reports back to a future telecon.

In the third paragraph of section 9.81, based again on previous discussion, I would propose the following text for the conclusion of this paragraph:

"If the ground VME receives a request to establish a third link with the aircraft it should honour the request. If a link establishment request is addressed to a VGS already having a link with the aircraft, any existing link between the stations should be disconnected silently on the aircraft and at the VGS."

However, this does expose a further consideration which is not specifically addressed by the existing text. Consider the case where an attempted autotune fails because the ground fails to recognise the downlink XID\_CMD\_HO, and the aircraft eventually reverts to the CSC and performs a link establishment. In this case no TG5 timers are started, and so the old link will be maintained for some considerable period which is wasteful, and may give rise to an ATN routing black hole. In this circumstance, I believe a standardised procedure is needed to lead to the orderly closure of the old link. It is tempting to suggest that a TG5 procedure should be applied here as well, but this can only work if the aircraft would never be expected to maintain two links with one service provider. Although this is generally not expected under

## ATTACHMENT 2

present operations, it does not appear to be specifically prohibited by the current standards. A point for discussion I believe.

Regards,  
Nick