IALA Input paper

Agenda item 11

Task Number xx

Author(s) / Submitter(s) USCG

IALA A-124 Appendix 14 Ed.2 FATDMA Start Slot Corrections

# Summary

## Purpose of the document

This document intends to show the slot conflict created when certain slot intervals are used in conjunction with the Absolute Slot Number FATDMA Schemas provided Annex B from Ed2 of Appendix 14 of A-124, and suggests new Absolute Start Slots for Annex B.

# Background

During planning and design of the US FATDMA Schema it was discovered that when using different slot increments recommended in Chapter 5 of A-124 Appendix 14, combined with the recommended start slots given in Annex B Absolute Slot Number and Use default FATDMA schemes table, slot conflicts were created that prohibited a base station from transmitting on one or both channels (depending on the schema).

# Discussion

## Annex B Absolute Start Slots

Annex B of Appendix 14 gives start slots for channel A & B for both a standard configuration, and where necessary, a “mirrored” configuration. These two standard configurations are denoted by the Roman numerals I and II to distinguish them from frequency channels A and B. The Usage Configurations are divided into three categories; Base Station Report, Data Link Management (DLM), and General Purpose.

### Assumptions

### Base Station Report reservations are used to reserve the 3 slots for Message 4 transmissions in non-semaphore mode or 9 in semaphore mode. 3 are reserved in the US Schemas, but 9 could result from a semaphore situation and are therefore accounted for in slot reservation schemas.

### The DLM reservations maintain the slot(s) in each frame that is used to reserve all other slots. 1 per frame is used in the US Schemas.

### The General Purpose reservations allow for all other transmissions determined by the competent authority to warrant guaranteed transmission without slot collision in the VDL.

### General Purpose Modifications

### US competent authority determined use cases of high timing requirements (defined in Paragraph 6.3), for the purpose of transmitting Message 21 and ASMs. The US Schemas divide the high timing requirements by purpose. There are 15 Message 21’s reserved per frame per channel denoted by Category 3 reservations, and 30 slots are reserved for ASM and other general purpose messages denoted by Category 4 reservations (see Figure 2.)

## Standard Referenced Schemas

Figure 1 denotes the 36 standard schemas given in Annex B with the Base Station Report set in non-semaphore mode with a DLM repetition of twice per frame on each channel. The General Purpose slots allow for up to 10 messages per frame, but are not sufficient for high timing use cases.

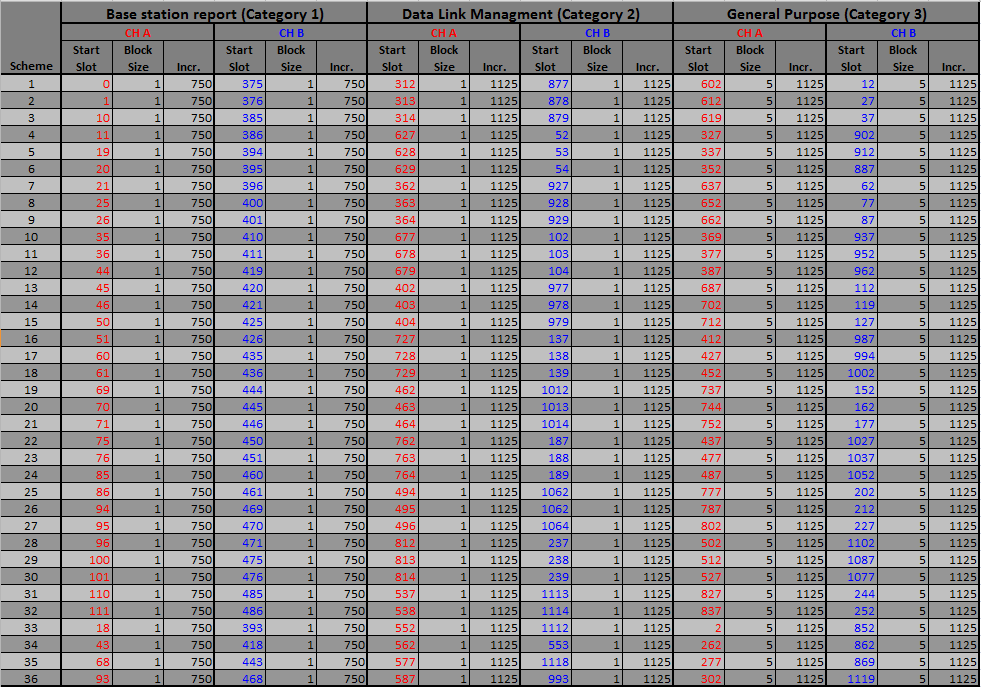


Figure 1 - Standard FATDMA Schemas

## Modified Start Slot Schema

### When high timing requirement slot reservations were set utilizing the start slots given in Annex B, slot reuse within the Base Station transmissions was created on half of the schemas which prevented the Base Station from transmitting specific message types that encountered the reuse.

### In general the reuse issue only affected one type of message on one channel, but in some cases the reuse issue spread across both channels or on multiple reservation types.

### Orange highlighted blocks in Figure 2 indicate adjustments in the start slot that had to be made to mitigate the reuse issue. The start slot was moved ±1-4 slots, depending on the reuse issue for that schema. Multiple highlighted blocks indicate that more than one start slot had to be modified for that schema to prevent slot reuse.

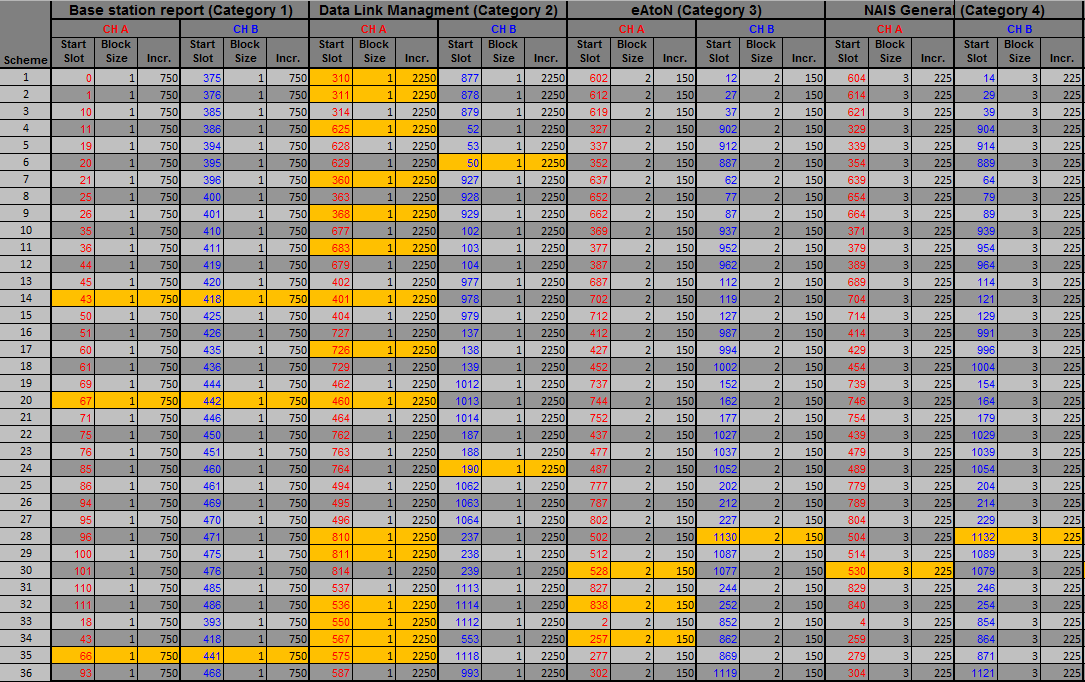


Figure 2 - FATDMA Schemas representing the modified Start Slots

### Examples of Reuse

### Schema 1 – the DLM start slot on Channel A was moved 2 slots back to prevent transmit slot reuse at slot 312 on Channel B. This is because there must be at least one slot of separation when switching transmit from Channel A to Channel B.

### Schema 14 – Start Slots for Message 4 on Channel A and B, and Message 20 on Channel B had to be modified to prevent transmit slot reuse on Channel B slot 421, 1171, and 1921, and slot reuse on Channel A slot 403.

### Schema 30 – Start Slots for General Purpose Messages on Channel A had to be modified to prevent slot reuse due to semaphore reservations on Channel B slot 226, 926, and 1726.

### Multiple Increment Errors

### The slot reuse errors occurred when multiple slot increment intervals were used as well. For example, when a slot increment of 150 created an error, slot increments of 5, 25, 50, 75, 450, and 750 would also create the same error. Similarly when slot increment of 225 is used, errors are also created with slot increments of 5, 25, 45, 75, 375, 450, and 1125.

# References

IALA A-124 Appendix 14 Ed. 2

# ACTION REQUESTED OF THE COMMITTEE

IALA is invited to examine the findings in this document and requested to revisit the FATDMA Schemas provided in Ed2 of Appendix 14 of A-124 in order to correct noted discrepancies in slot use that prevent transmissions either on channel A or B or both, depending on the slot conflict created with different slot intervals.