ARINC 735B to ARINC 735C Change Overview

(As of January 29, 2021)

ARINC 735B – ARINC 735C Change Overview

- Document updated to describe interface definitions and protocols for ACAS Xa and ACAS Xu instead of TCAS II.
  - Refer to unit as "ACAS X Traffic Computer"
  - Remove TCAS II specific interface and protocol items
  - Update Intro and Descriptions sections for ACAS X rather than TCAS II

  - (Section numbering consistent with ARINC 735B is not maintained)

ARINC 735B – ARINC 735C Change Overview

- **Newly Defined Labels**
  - Label 270 – TCAS Resolution Advisories Report Part 1 Segments 0,1,2 and 3 (for ACAS Xu)
  - Label 270 – TCAS Resolution Advisories Report Part 2 Segments 0, 1, 2 and 3 (for ACAS Xu
  - Label 270 - Operational Coordination Message Report Segments 0, 1, 2 and 3
  - Labels 170, 171 and 172 - Remain Well Clear Guidance (for ACAS Xu)
  - Label 272 (from FMS) was repurposed for ACAS Xu Vertical Rate Performance Limit and Label 273 was added for ACAS Xu Turn Rate Performance Limit (Table 6A-6)
  - Label 165 (ACAS Xa to Display) added for Designated Intruder Xo Mode and Status.

ARINC 735B – ARINC 735C Change Overview

- Existing labels added to tables
  - GPS Labels 103, 112, 130, 136, 145, 165, 247 added to table 6A-3 "inputs from GPS"
  - Label 205 "Mach" added to table 6A-5

ARINC 735B – ARINC 735C Change Overview

- Changed Labels
  - Label 271 – Horizontal Resolution Advisories (added Target Track Angle and Combined Control)
  - Label 274 – TX word (Added CCCB, DAA and RWC Active bits)
  - Label 276 – XT TCAS Control Data (Added OCM Transmit Status bit)
  - Label 352 – TCAS to Maintenance Computers (added ADC #2, C2 Link and ATAR Interface Status bits)
  - Label 360 – TCAS to Maintenance Computers (Deleted Altitude Limit PP bits, change alternate antenna select PP to spare)
  - Label 361 – TCAS to Maintenance Computers (Deleted Climb Inhibit/Performance Limit bits)
  - Label 361 – TCAS to Maintenance Computers (Changed Advisory Cancel to Spare)
  - Label 361 – TCAS to Maintenance Computers (Deleted TA Display Status)
  - Label 363 – TCAS to Maintenance Computers (Deleted Mag Heading and Attitude Valid discrete bits)(added TA Only with Aurals Discrete)
  - Label 364 – TCAS to Maintenance Computers (Deleted Mag/True Heading Input bit)
  - Label 365 – TCAS to Maintenance Computers (Added AOTO Program Pin
  - Label 270 – TCAS Capability Report Segment 0 (Added Version Coding bits)

ARINC 735B – ARINC 735C Change Overview

- Deleted Labels
  - Label 025 – Selected Altitude (used for TCAS Altitude Alerter)
  - Label 273 (TX bus ARA/RAC for DO-185 TCAS)
  - Label 272 – TCAS Performance limits was repurposed for ACAS Xu

ARINC 735B – ARINC 735C Change Overview

- Input/Output Removals
  - Climb Inhibit Discrete Inputs
  - Increase Climb Inhibit Discrete Inputs
  - Aircraft Performance Limit Program Discrete Input
  - Advisory/Annunciator Cancel Discrete Input
  - Resolution Advisory Word 270 Discrete Outputs (12 to flight recorder)
  - TA Display Enable Discrete Output
  - Visual Advisory Discrete Outputs (one of three (preventative RA) removed)
  - Aural Advisory Discrete Outputs (one of three (preventative RA) removed)
  - MCDU Input #3 (ARINC 429)

ARINC 735B – ARINC 735C Change Overview

- Input/Output Removals
  - Aircraft Performance Altitude Limit Program Pins
  - GPS Time Mark Input #1 and #2 (RS 422)
  - Reserved for Mag Heading, Pitch Attitude and Roll Attitude Synchro Inputs
  - Mag Heading Valid Discrete
  - Selected Altitude (both ARINC 429 and Synchro)
  - ASAS Provision ARINC 429 output (changed to Manufacturer Defined)
  - Mag/True Heading Discrete Input
  - Alternate Antenna Select Program Pin
  - TA Display Status Discrete Input #1 and #2
  - RA Display Bus #1 and #2 (ARINC 429 Outputs)

ARINC 735B – ARINC 735C Change Overview

- Input/Output Additions
  - TA Only (with Aurals) discrete input
  - ADS-B Only TA Only (AOTO) Program Pin
  - ADC Input #2 (ARINC 429)
  - Ethernet TX and RX (provisioned using existing pins) allocated to ATAR for ACAS Xu
  - FIM (TBD)

ARINC 735B – ARINC 735C Change Overview

- Drawing Updates (In Progress)
    - Attachment 1 – architecture and interface diagrams
    - Attachment 2 – ARINC 600 connector
    - Attachment 4 – ARINC 600 connector
    - Attachment 11 – XT – TX Start-Up Timing

ARINC 735B – ARINC 735C Change Overview

- Deleted Sections
  - 1.4.5 Relationship to ARINC 735A TCAS
  - 3.2.2 Aircraft Climb Performance Inputs
  - 3.2.3 Reserved Flight/Performance Management Interface
  - 3.2.4 Reserved Altitude Alerter Interface
  - 3.5.1.1 Climb Inhibit Discrete Inputs
  - 3.5.1.2 Increased Climb Inhibit Discrete Inputs
  - 3.5.1.3 Aircraft Performance Limit Discrete Input
  - 3.5.1.9 Advisory/Annunciator Cancel
  - 3.5.1.10 RA/TA System Status Discrete Inputs
  - 3.5.2.1 Resolution Advisory Discrete Output
  - 3.5.2.2 TA Display Enable Discrete Output
  - 3.6.1 Aircraft Performance Altitude Limit
  - 4.7 BITE Initiation
  - 4.9.2 Unit Identification
  - 6.0 subsections VSI/TCAS Display (6.0 retained and only indicates backward compatibility)
  - All 'not used' sections were removed

ARINC 735B – ARINC 735C Change Overview

- Deleted Attachments
  - Attachment 5B ATCRBS Reply Code Pulse Characteristics
  - Attachment 11 NOT USED
  - Attachment 14 Standard VSI/TCAS Display Interwiring
  - Attachment 15 Alternate #1 VSI/TCAS Display Interwiring
  - Attachment 16 Alternate #2 VSI/TCAS Display Interwiring
  - Attachment 17 Alternate #3 VSI/TCAS Display Interwiring

ARINC 735B – ARINC 735C Change Overview

- New/Updated Sections or Attachments
    - 3.2.6 ADC Interface
    - 3.2.7 ATAR Interface (also Attachment 3B-7)
    - 3.2.8 FIM Interface (TBD)
    - 3.3.3.1.2 and subsections - Resolution Advisories Report
    - 3.4.3 ACAS Xu Display
    - 3.4.5 Display Status Discrete
    - 3.6.9 ADS-B Only TA Only (AOTO) Program Pin
    - 4.8 Event Download
    - ACAS Xu C2 Link and Performance Data (Attachment 3B note 7)
    - Attachments 3A, 3B, 6, 13, 14

(These are new sections or sections that had considerable changes. Many other sections were changed as well.

ARINC 735B – ARINC 735C Change Overview

- Open Items
  - Need to add interface descriptions for FIM in section 3.2. Overview level but not the detailed specifics of protocol. (Kurt and Mohammed)
- Figure Updates

Next Steps

- Formal Review (February 1 – March 5)
- Final Comment Incorporation (March 8 – March 19)
- Final Draft Available (March 22)

Many Thanks to the Review Team

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