

AEEC Project Paper 735B

Traffic Computer Standards Development Activity

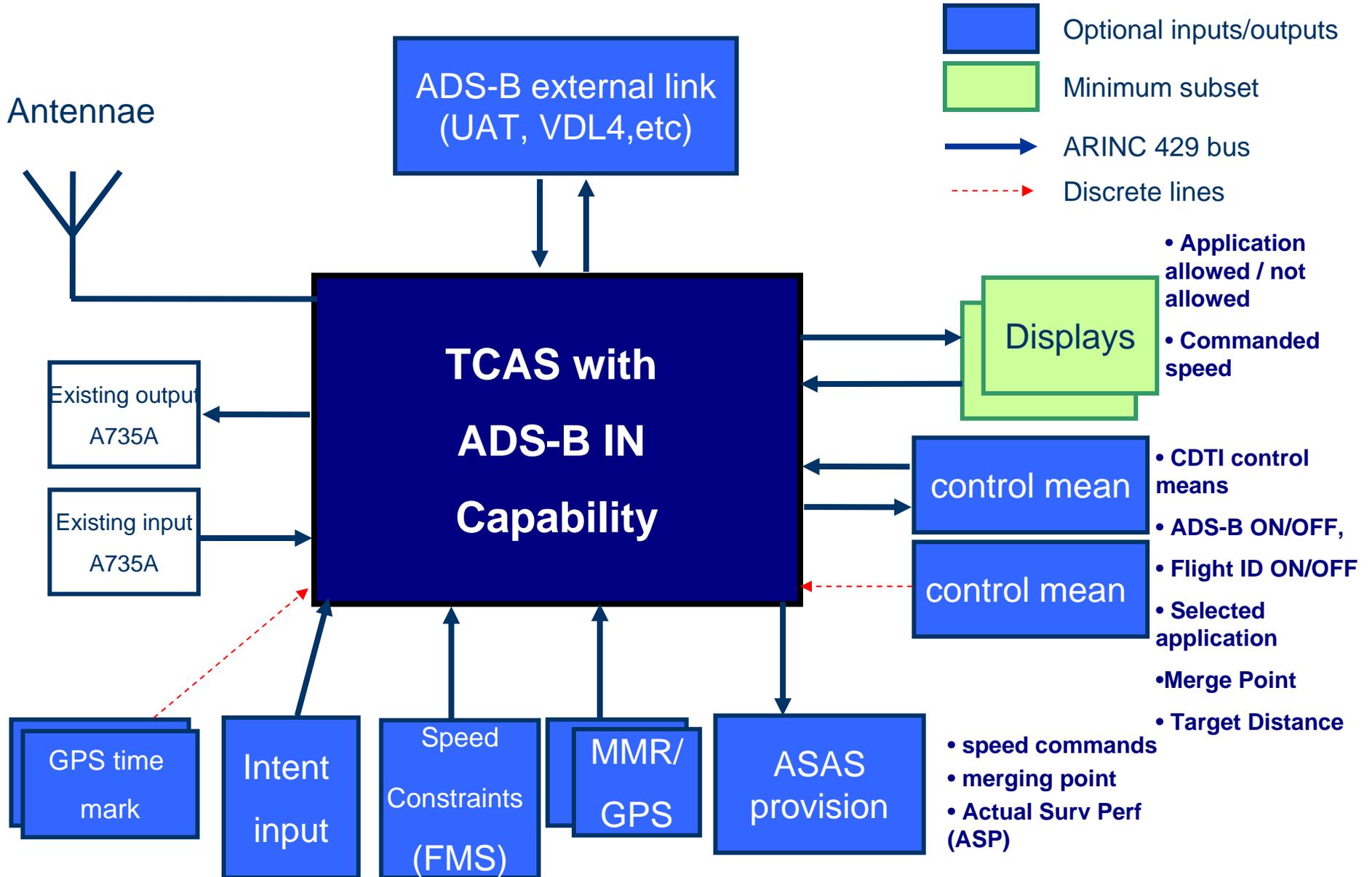


***RTCA SC-186 WG4
May 16, 2007
Washington, D.C.***

AEEC activity: Traffic Computer

- Initiated: September 2006
- ARINC 735B, “TCAS with ADS-B Capability”
 - Introduce ADS-B capability in TCAS specification
 - Define form, fit, function and interface
 - Support ADS-B functions in ASA MASPS (DO-289):
 - Enhanced Visual Acquisition (EVAcq)
 - Conflict Detection (CD)
 - Airborne Conflict Management (ACM)
 - Airport Surface Situational Awareness (ASSA)
 - Final Approach and Runway Occupancy Awareness (FAROA)
 - Enhanced Visual Approach (EVApp)
 - Provide for In Trail Procedure, Sequencing and Merging and other ADS-B applications currently being demonstrated or currently nearing certification, respectively
 - Goal: AEEC approval – September 2007
- Chairman: Greg Kuehl, UPS

Retrofit and Current Production



ARINC 429 Interfaces

- Interwiring definition complete: new ARINC 429 inputs
 - Crew Control Interface – MCDU interface (ARINC 739A)
 - GPS Interface – Ownship position, trajectory and position from GNSS (ARINC 743A, 755, 756, 760), depending on aircraft type.
 - FMS Interface - Flight plan information, winds and minimum speeds for long range conflict detection and resolution.
 - IRS Interface - Pitch angle, roll angle, track, heading and ground speed information for ownship trajectory and attitude.
 - ADC Interface – Baro altitude for own aircraft altitude. Baro rate, air temperature, CAS/TAS for applications where speed data is needed.
- Display Traffic Information File (DTIF) Type 4 Word, Intruder Information Quality, per DO-289, Table 2-3
- Display Traffic Information File (DTIF) Type 5 Word, Intruder Information Length/Width Word, per DO-260A Change 1, Table 2-74
- ADS-B Application Information File with flexible word size describing those key parameters for the specific ADS-B applications present.

Traffic Selector Discrete Inputs

<u>A735B</u>	<u>Alt (DO-289)</u>	<u>Definition</u>
Highlight	Select	Target for which additional information is requested by the flight crew. An example is an aircraft highlighted for which ownship desires position data (lat, long, altitude).
Select	Couple	Target upon which a procedure is intended to be conducted. An example is an aircraft selected which ownship intends to merge behind, in a merging and sequencing procedure.
Couple	No equivalent term	Target upon which a procedure is intended to be conducted with and where an automated maneuver has been launched. In order for a couple operation to take place, an intended target has been first selected. An example is an aircraft coupled which ownship has engaged its control system (flight control, FMS) to ensure a spacing procedure is carried out.

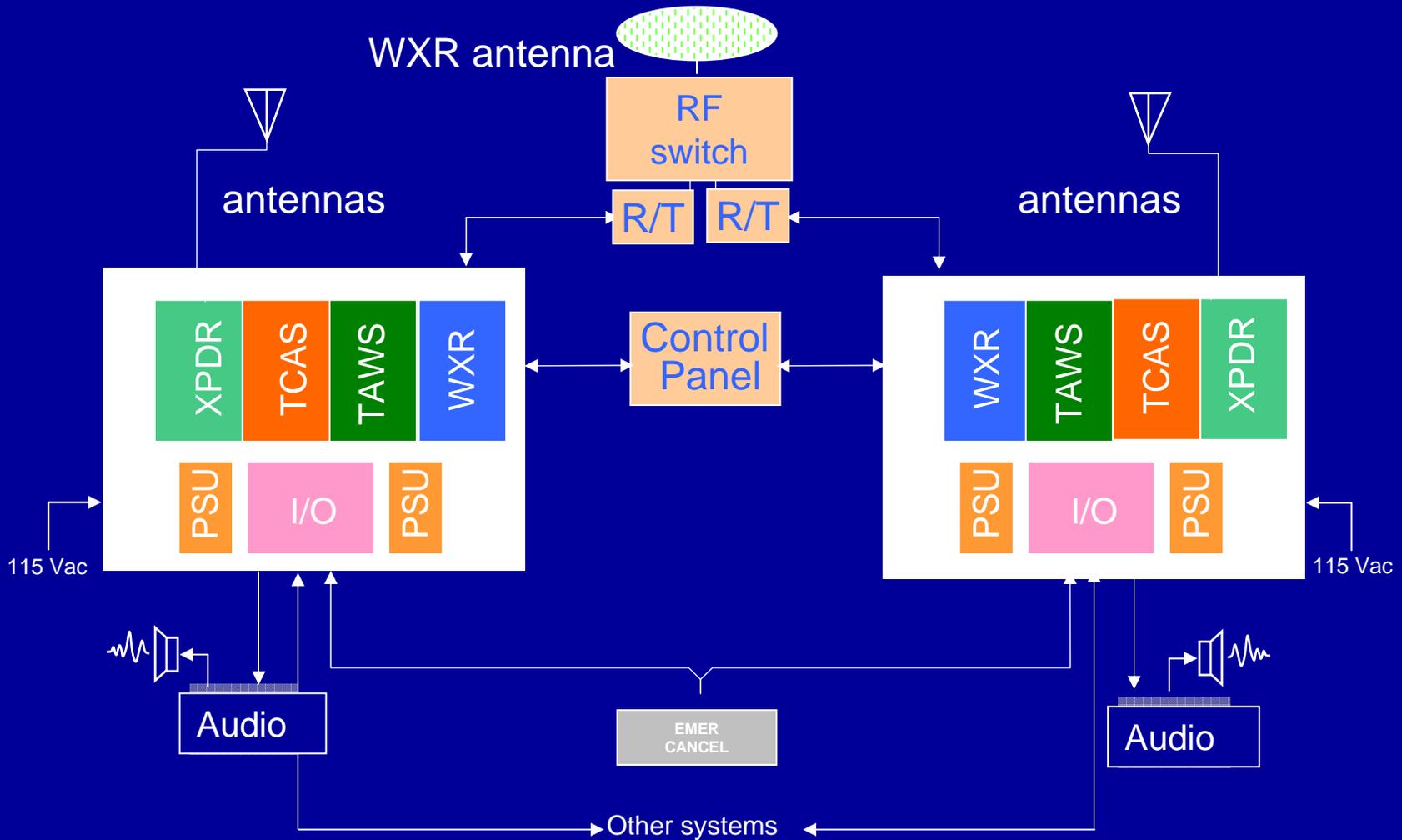
A380 and B-787 Considerations

ARINC 768: Integrated Surveillance System (ISS)

- *Traffic Surveillance (718A & 735A)*
 - *Enroute, Terminal, Airport Surface*
- *Terrain & Obstacle Surveillance (762)*
 - *Terrain Awareness (TAWS)*
- *Weather Surveillance (708A)*
 - *Precipitation, Windshear, Clear Air Turbulence, etc*

Apply ISS concept to future production single-aisle

ISS Architecture



ARINC 768 – Supp 2

- ARINC 768 ISS growth path
- ISS Type D - XPDR, TCAS and TAWS in one LRU
 - Standard TSO-C119b compliant transponder
 - ARINC 735B ADS-B functions added to ISS
 - No WXR
- Control panels w/bi-direct ARINC 429 buses
- Growth for UAT per RTCA DO-282
- Add connector option for single aisle installs (?)
- Expected completion date December 2008

Future Activity

- Mature ARINC 735B will provide near-term support for airline retrofit programs in 2007
 - Focus on operational efficiency
- RTCA and EUROCAE participant comments are invited
 - Comments to ACSS before May 30
- Beyond 2007 - ADS-B Program in the United States
 - Support SC-186 / WG51 MASPS and MOPS
- Beyond 2007 - Single European Sky Initiative
 - Global solutions and common equipment standards
- Future revision to ARINC 735B as required

