Wilfred Goh

Traffic Surveillance Product Manager

Honeywell ADS-B Product Update

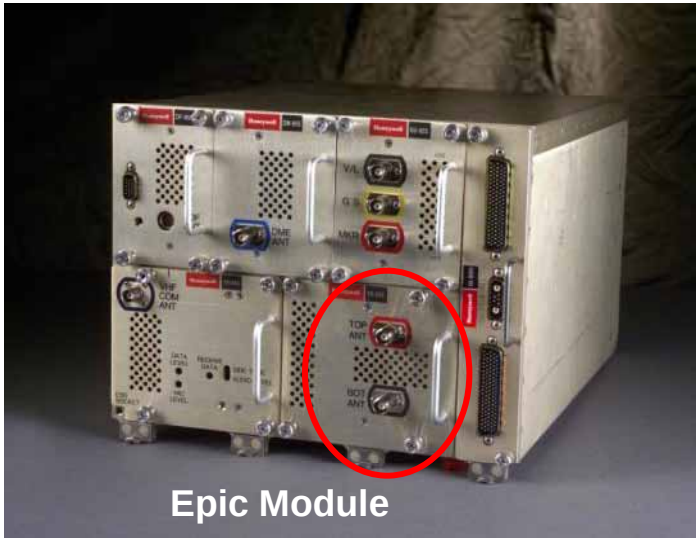
Honeywell

Honeywell Transponders

AESS

TRA-67

MST-67



Epic Module

Primus II

Apex Module
KXP-2290

KT-73 Panel Mount

Honeywell ADS-B Out Equipment and Equipage

Product	Application	DO-260	DO-260A	DO-260B	Fielded Units
Integrated Surveillance	Air Transport	--	Available	In Work	50
TRA-67	Air Transport	Available	--	In Work	20,000
Epic	Regional, Helicopter Business Aviation	--	Available	In Work	2,500
Primus II	Regional Business Aviation	--	--	In Work	9,000
MST-67	Regional Business Aviation	--	--	Planned	10,000
APEX	Business Aviation General Aviation	--	--	Planned	500
KT-73	General Aviation	Available (non-diversity)	--	Planned	3,000

Honeywell TCAS / Traffic Computers

TPA-100

TPU-66/67

AESS

KTA/KMH

Honeywell ADS-B In Equipment and Equipage

Product	Application	ADS-B In	Comments	Fielded Units
TPA-100	Air Transport Business Aviation	Available	SmartTraffic™ Airborne Situational Awareness Visual Separation on Approach In Trail Procedure (ITP)	3,000 +7,500 TPA-81A
Integrated Surveillance	Air Transport	In Work	SmartTraffic™ Airborne Situational Awareness Visual Separation on Approach In Trail Procedure (ITP)	50
TPU-66/67	Regional Business Aviation	Planned	Specific Plans and Functionality being Developed based on Customer Input	5,000
KTA / KMH	Business Aviation Gen Aviation Helicopter	Planned	Specific Plans and Functionality being Developed based on Customer Input	5,000

Honeywell SmartTraffic™

- SmartTraffic is the family name of ADS-B enabled functions hosted within Honeywell TCAS / Traffic Computers
- SmartTraffic includes airborne ADS-B In applications such as:
  - Hybrid Surveillance
  - Cockpit Display of Traffic Information (CDTI)
  - In-Trail Procedure (ITP)
  - Visual Separation on Approach (VSA)
  - Surface (SURF) and Surface Indications and Alerts (SURF IA)

Honeywell Navigation / GNSS

– Honeywell has a broad range of navigation products that meet current and proposed ADS-B navigation performance requirements
  - GPS-based Systems (MMR or GNSSU)
  - Inertial Reference Systems (IRS) with High Integrity GPS Hybrid (HIGH)

– Evaluating backup navigation system solutions
  - Example: Alternative Position Navigation Timing (APNT) using DME/DME/IRS

ADIRU
Air Data Inertial Reference Unit

Bendix/King KLN-94

APEX GNSSU

US Aviation Rulemaking Committee

The ADS-B Out Aviation Rulemaking Committee (ARC) examined ADS-B Out compliance, including costs and benefits, prior to finalizing ADS-B regulation.

- The Surveillance and Broadcast Services (SBS) office launched several programs to evaluate and demonstrate key technologies

The new ADS-B In ARC is now analyzing ADS-B based applications that will take advantage of the regulation.

Honeywell ARC participation:

- Active ARC membership and involvement (ongoing)
- SURF IA Demonstration Program (via the SBS office)
- ITP Demonstration Program (via SBS office)

Establish Requirements, Encourage Development, Validate Performance, and Demonstrate Value ...Keys to Success

SURF IA Operational Evaluation - Summary

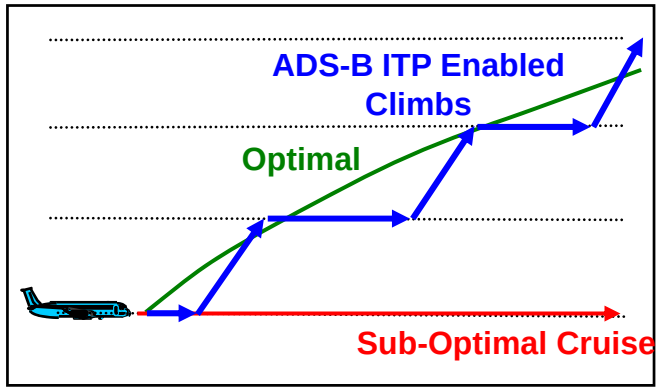
Program November 2008 through January 2010

- Accelerate SURF IA standards development by producing:
  - Operational Performance Assessment
  - Operational Safety Assessment
- Develop display concepts and indication and alerting algorithms
  - Honeywell human factors evaluation included JetBlue Airways and Alaska Airlines pilots
- Prototype display, surveillance and alerting functionality
  - Honeywell used King Air and Sovereign test aircraft
- Demonstrate the system
  - Honeywell demonstrated at Seattle-Tacoma International airport (SEA) and Snohomish County Paine Field airport (PAE)

Operational Evaluation is Completed

FAA/UAL/Honeywell ITP Program

- Joint FAA/UAL/Honeywell Program
  - Demonstrate operational benefits enabled by the ADS-B In, In Trail Procedures
  - Honeywell is developing, integrating, and certifying complete ITP avionics capability to be installed on United Airlines 747-400
- Avionics system consists of:
  - Honeywell Traffic Computer, TPA-100B with ADS-B In and ITP capability
  - Honeywell Transponder, TRA-67B with ADS-B Out capability
  - Class 3 EFB running Honeywell ITP display software
- United Airlines will operate approximately 12 Honeywell ITP avionics equipped 747-400 aircraft in the South Pacific (SOPAC) route for a 1 year Operational Evaluation (APR-2011 to APR-2012)



Single European Sky ATM Research (SESAR)

- Honeywell Program Participation:
  - Surface Situational Awareness and Traffic Alerting
    - Traffic Computer prototype
    - Algorithms and simulator analysis
  - Merging and Spacing
    - Traffic Computer prototype for lab and flight testing
  - 1090 MHz Capacity and Future ADS-B Requirements
  - Future TCAS Enhancements

- Leveraging Honeywell experience in flight safety, situational awareness, traffic surveillance, and human factors
- Program Extends from 2009 through 2020

Working Toward Harmonization of SESAR and NextGen

Industry Opportunities and Recommendations

- Harmonize with existing worldwide regulation
  - Converge on ADS-B Out Timing – aligned with Europe and the US
    - Equipage by 2020
      - » Critical mass with Europe in DEC-2017 and US in JAN-2020
  - Converge on ADS-B Requirements – aligned with Europe and the US
    - ADS-B Out via Mode-S DO-260B
    - Specify required navigation performance, not the means to accomplish it
      - » Example: Do not require SA Aware for NAV/GNSS
- Incentivize Equipage for Early Adoption
  - Example: Preferred routing, such as Hudson Bay and Gulf of Mexico
- Engage in ADS-B In application demonstrations and analysis
  - ATC coordination is key
- Accelerate Ground Infrastructure

Thank You

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