Wilfred Goh
Traffic Surveillance Product Manager

Honeywell ADS-B Product Update
Honeywell Transponders

Honeywell Proprietary
### Honeywell ADS-B Out Equipment and Equipage

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>DO-260</th>
<th>DO-260A</th>
<th>DO-260B</th>
<th>Fielded Units</th>
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<tbody>
<tr>
<td>Integrated</td>
<td>Air Transport</td>
<td>--</td>
<td>Available</td>
<td>In Work</td>
<td>50</td>
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<tr>
<td>Surveillance</td>
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<tr>
<td>TRA-67</td>
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<td>In Work</td>
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<tr>
<td>Epic</td>
<td>Regional, Helicopter Business</td>
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<td>Available</td>
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<td>MST-67</td>
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<tr>
<td>APEX</td>
<td>Business Aviation</td>
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<td>--</td>
<td>Planned</td>
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<tr>
<td>General Aviation</td>
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<td>KT-73</td>
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Honeywell Proprietary
Honeywell TCAS / Traffic Computers

TPA-100

TPU-66/67

AESS

KTA/KMH
### Honeywell ADS-B In Equipment and Equipage

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>ADS-B In</th>
<th>Comments</th>
<th>Fielded Units</th>
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<tr>
<td>TPA-100</td>
<td>Air Transport Business Aviation</td>
<td>Available</td>
<td>SmartTraffic™ Airborne Situational Awareness Visual Separation on Approach In Trail Procedure (ITP)</td>
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<tr>
<td>Integrated Surveillance</td>
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<td>SmartTraffic™ Airborne Situational Awareness Visual Separation on Approach In Trail Procedure (ITP)</td>
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<td>TPU-66/67</td>
<td>Regional Business Aviation</td>
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<td>Specific Plans and Functionality being Developed based on Customer Input</td>
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<tr>
<td>KTA / KMH</td>
<td>Business Aviation Gen Aviation Helicopter</td>
<td>Planned</td>
<td>Specific Plans and Functionality being Developed based on Customer Input</td>
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</table>
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

Honeywell Proprietary
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