Surveillance and Broadcast Services

Program Overview

By: Jimmy Wright
Surveillance and Broadcast Services - WSA
Date: October 23, 2013
Today’s Air Transportation System

- Ground-based
- Human-centric and un-automated
- Single channel voice control
- Aging Infrastructure (youngest En Route facility – 43 years)
What Changes Improve Services?

**Today**
- Ground-based navigation and surveillance
- Air Traffic Control communications by voice
- Air traffic “control”
- Fragmented weather forecasts
- Airport operations limited by visibility conditions

**NextGen**
- Satellite-based navigation and surveillance
- Routine information sent digitally
- Air traffic “management”
- Forecasts embedded into decisions
- Operations continue into lower visibility conditions
Background: Automatic Dependent Surveillance - Broadcast (ADS-B)

- **Automatic**
  - Periodically transmits information without pilot or operator input

- **Dependent**
  - Position and velocity vector are derived from the Global Positioning System (GPS)

- **Surveillance**
  - A method of determining position of aircraft, vehicles, or other asset

- **Broadcast**
  - Transmitted information available to anyone with the appropriate receiving equipment
Alaska Status

33 Sites Reporting on Network : 33 Sites Constructed : 4 Sites in Planning or Construction

Does not include the 5 unordered Alaska service volumes or the Anchorage ASSC service volume.

41 Total Sites
Current ADS-B Coverage area

- 3000 MSL
- 5000 MSL
- 18000 MSL
2014 ADS-B Coverage area

- 3000 MSL
- 5000 MSL
- 18000 MSL
Aircraft Equipage Rule

• Mandatory by Jan 1, 2020
• FAA published the Final Rule On May 27, 2010 for ADS-B Out equipage
  – This rule mandates performance requirements for ADS-B avionics that will be required to fly in certain airspace
  – ADS-B Out transmits location information received from the Global Navigation Satellite System out of the aircraft to ADS-B ground stations and to other aircraft equipped to receive ADS-B broadcasts. The rule does not preclude other navigation source methods.
  – This rule does not mandate ADS-B In
Required ADS-B Airspace (In Green)

Note: 1090MHz ES link is required above FL180
New Free Services Available to GA

Pilot Advisory Services

Traffic Information Services – Broadcast (TIS-B) is a service which provides ADS-B equipped aircraft with position reports from secondary surveillance radar on non-ADS-B equipped aircraft.

Flight Information Services – Broadcast (FIS-B) is a service which transmits graphical National Weather Service products, pilot reports, and special use airspace.

<table>
<thead>
<tr>
<th>Free Products</th>
<th>Update Interval</th>
<th>Transmission Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRMET</td>
<td>As Available</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Convective SIGMET</td>
<td>As Available then at 15 minute intervals for 1 hour</td>
<td>5 minutes</td>
</tr>
<tr>
<td>METAR / SPECI</td>
<td>1 minute (where available) as available otherwise</td>
<td>5 minutes</td>
</tr>
<tr>
<td>NEXRAD Reflectivity</td>
<td>~ 5 minutes (10 minutes for clear air mode)</td>
<td>15 minutes</td>
</tr>
<tr>
<td>(CONUS)</td>
<td></td>
<td></td>
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<tr>
<td>NEXRAD Reflectivity</td>
<td>~ 5 minutes (10 minutes for clear air mode)</td>
<td>2.5 minutes</td>
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<tr>
<td>(Regional)</td>
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<tr>
<td>NOTAMs - D/FDC</td>
<td>As Available</td>
<td>10 minutes</td>
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<tr>
<td>PIREP</td>
<td>As Available</td>
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</tr>
<tr>
<td>SIGMET</td>
<td>As Available, then at 15 minute intervals for 1 hour</td>
<td>5 minutes</td>
</tr>
<tr>
<td>SUA Status</td>
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<td>10 minutes</td>
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<tr>
<td>TAF / AMEND</td>
<td>8 hours</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Temperature Aloft</td>
<td>12 hours</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Winds Aloft</td>
<td>12 hours</td>
<td>10 minutes</td>
</tr>
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Advisory Service: Traffic Information Service - Broadcast

TIS-B is a service which provides ADS-B equipped aircraft with position reports from secondary surveillance radar on non-ADS-B equipped aircraft.
Advisory Service: Flight Information Service - Broadcast

FIS-B transmits graphical National Weather Service products, pilot reports, and special use airspace.
Capstone En Route- RNAV
Airborne Applications

Enhanced Visual Approach

Airport Traffic Situational Awareness
Benefits on the ground

- Allows commercial operators to:
  - Track Aircraft Positions (Fleet Monitoring)
  - Initiate Search and Rescue Efforts

Displayed over the internet
Results – Safety

Capstone Phase I Reduction in Aircraft Accident Rate

Accidents / 100K Ops

Not Equipped

47% reduction

Capstone Equipped

Source: The Impact of Capstone Phase I Program – Final Report; UAA, The MITRE Corp, Embry Riddle; Sept 2006
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