“SWIM in the Sky”
Empowering New Collaborative ATM Relationships
Presented by Steve Bradford
Aircraft Access to SWIM (AAtS)

DMS = Data Management System

AOC/FOC

NextGen Cockpit

DMS = Data Management Service

NAS Services

Weather
Traffic Flow Management
Aeronautical Information
Trajectory Operations: Transformation

**Procedural Based Control:**
*Control on Where We Think the Aircraft Is*

- Landmark Navigation
- Radio Beacons
- Position Reports

**Surveillance Based Control:**
*Control on Where We Know the Aircraft Is*

- VOR/DME
- RADAR

**Trajectory Based Control:**
*Control on Where We Know the Aircraft Will Be*

- RNP
- ADS-B
- DataComm
Trajectory Timeline

Collision Avoidance

Separation Management

Trajectory Management

Airspace Management

Flow Management
Historical Interactions

1. Collision Avoidance
2. Separation Management
3. Trajectory Management
4. Flow Management

Voice
Strategic Data Connection
DATA

FOC
PIC
TMU
Controller
Current Interactions

- **Voice**
- **Strategic Data Connection**
- **DATA**

### Interactions

1. **Collision Avoidance**
2. **Separation Management**
3. **Trajectory Management**
4. **Flow Management**

####_nodes:
- **A/C Controller**
- **PIC**
- **FOC Automation**
- **TMU Automation**
- **TFM Automation**
- **Controller**

####_arrows:
- Red dotted line: Voice
- Red line: Strategic Data Connection
- Red solid line: DATA
- Green dotted line
- Green solid line
- Purple dotted line
- Purple solid line

####_numbers:
- 1
- 2
- 3
- 4
Future Interactions

Voice
Strategic Data Connection
DATA

PIC
A/C
ATM
Automation

FOC Automation
FOC
Controller
TMU

1. Collision Avoidance
2. Separation Management
3. Trajectory Management
4. Flow Management
What is AAtS?

- Aircraft Access to SWIM (AAtS)
  - Establishes airborne component of ground based SWIM Service Oriented Architecture (SOA)
  - Facilitates exchange of aeronautical/flight information among pilots and other National Airspace System (NAS) users
  - Facilitates a commonly sourced/shared aviation information environment for collaborative decision making
  - Leverages existing air/ground third party service providers’ infrastructure and technologies
  - Supports global interoperability/harmonization with similar systems/capabilities
Enterprise Data to Aircraft
AAtS focuses on Mission Services to provide data to aircraft

Mission Services (e.g. AAtS)
Data Standards & Harmonization
FTB SWIM Core Services (Task M)
FTI Network Management
Full Data Exchange Concept

• NAS to Aircraft data distribution (Phase 1)
  – Traditional uplink of SWIM enabled NAS services data via DMS consumption
    • Outbound from NAS
  – Conforms to existing and developing data link operational use policies, processes and standards

• NAS and Aircraft data exchange (Phase 2)
  – The SWIM enabled NAS services now exchange information with the DMS across the SOA infrastructure
    • Both outbound from NAS and inbound into NAS
  – DMS becomes a provider of aircraft generated information
  – Includes NAS to Aircraft data distribution
  – Data link operational uses, policies, processes and standards being developed
Data Management Service (DMS)

• CSS-Wx Data Products Supported:
  - METARs (Routine Aviation Meteorological Report)
  - TAFs (Terminal Aerodrome Forecast)
  - NEXRAD (Doppler Radar)
  - PIREP (Pilot Reports)
  - AIRMET/SIGMET (Airmen's Meteorological Information / Significant Meteorological Information)
  - Terminal Wind Forecast
  - Terminal Icing Probability and Severity Forecast
  - Aeronautical Information Management (AIM)
  - NOTAMs
Data Management Service (DMS)

• Functionality:
  ➢ Ingests product data from SWIM Services
  ➢ Manages onboard client data link communications
  ➢ Manages onboard client subscriptions and requests
  ➢ Synchronizes EFB/DMS communications with OCC
  ➢ Manages user profiles
Electronic Flight Bag (EFB) Application(s)

- Device(s) Being Used: Apple iPad & NavAero
- Operating System(s): Apple iOS & Microsoft Windows, respectively
- Products:
  - METARs (Routine Aviation Meteorological Report)
  - TAFs (Terminal Aerodrome Forecast)
  - NEXRAD (Doppler Radar)
  - PIREP (Pilot Reports)
  - AIRMET/SIGMET (Airmen's Meteorological Information / Significant Meteorological Information)
  - NOTAM (Notices to Airmen)
  - Terminal Wind Forecast
  - Terminal Icing Probability and Severity Forecast
Operations Control Center (OCC)

• Web portal interface
• Create aircraft records (Flight #)
• Subscribe/Unsubscribe products
• Create profiles
  + Includes subscriptions for products (METARs, TAFs, AIRMETs, SIGMETs, etc.)
• Apply specific profiles to any aircraft
• Synchronization view
Current AAtS Activities

• Concept definition:
  – AAtS Concept of Operations Update (Uplink/Downlink)
  – Revised AAtS Technical Concept to include Uplink and Downlink of Information

• Technical investigations:
  – Security Aspects, Data Priority and Preemption, Wired vs. Wireless Connectivity, Uplink/Downlink Validation, & Interoperability/Standards Harmonization

• AAtS Operational Demonstrations
  – Conducting live operational flight demonstrations of information uplink
    • Corporate/business aircraft
    • Domestic/commercial aircraft
AAtS Implementation Guidance

• Implementation Guidance Document is:
  – Not a draft working paper (i.e., can be referenced)
  – Available publicly now in addition to the previous limited release
  – Being reviewed by AEEC 830/839, Data Link Users Forum, and SAI Subcommittee as well as ICAO

• Implementation Guidance Document allows:
  – Operators and implementers to begin planning their implementations
  – AVS to plan future guidance work
  – SC-206 to reference the document’s concepts
More Information

• Points of Contact
  – Robert Klein, AAtS Technical Research Lead
  – Angel Morales, AAtS Concept Development Lead
  – Jon Standley, AAtS Demo Program Manager

• Have a question for us?
  – Email: 9-ANG-AAtS@faa.gov