Data Communications Program

Program Overview

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Program Background - Functions

• Provides two-way data link between controllers and flight crews
  – Extends ground-based automation to the cockpit
  – Brings connectivity to the cockpit, leverages FAA automation improvements
  – Future requires direct integration with the cockpit

• Necessary to transition from voice-based ATC communications system to data-centric NextGen
Program Background - Scope

Increased Safety – Reduced Operational Errors
  • Clearer, enduring communications

Ground Delay Savings
  • Revised Departure Clearance
  • Airport Information
  • Flow Initiatives

Aircraft Fuel Savings
  • Direct Reroutes
  • Crossing Restrictions
  • Tailored Arrivals

En Route Delay Savings and Increased Controller Productivity
  • Seamless Uplink of Flow Initiatives / TFM Reroutes – “Go” Button
  • Comm Transfer Workload Reduction
  • More Efficient Delivery of Clearances
  • Allows Uplink of More Complex Clearances
  • En Route Notifications

• Safety-of-flight air traffic control (ATC) clearances, instructions, traffic flow management, flight crew requests and reports
• Data Comm services and benefits in Tower and En Route domains
Service Delivery

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Range for start of deployment
Segment 1 Initial Tower Service

• Revised Departure Clearances (DCL) including revisions transmitted to the aircraft on the ground
  – Enables full route clearances and revisions
  – Exploits Future Air Navigation Systems (FANS) avionics found in newer aircraft
  – Will not impact existing pre-departure clearance (PDC) services

• Potential for use as NextGen Best Equipped-Best Served

• Field trials starting in 2012
  – Exercise DCL procedures
  – Coordinating participation with American, Continental, Delta, FedEx, and United
Segment 1 En Route Services

- **Transfer of Communications (TOC) Service and Initial Check-in (IC) Service**
  - Enables controllers to handle traffic more strategically
  - Projected capacity increase of 15%-21% depending upon altitude
  - Basic capability with minimal overrides - use voice for special cases
Segment 1 En Route Services

• **“Go Button”**
  – Leverages Traffic Flow Management (TFM) program for more direct reroutes
  – Enables quicker recovery from bad weather or other Traffic Management Advisory situations
  – Required for full realization of capabilities and benefits from TFM

• **Pilot Initiated Downlink – Request for direct-to-fix**
  – More direct routes quickly and easily negotiated between controller and pilot
  – Reduces flight times and distance
  – Benefit of shortcutting to save fuel
Segment 1 En Route Services

• Controller initiated direct-to-fix and controller response to this pilot request for direct-to-fix
  – Enables controllers to effectively handle more traffic
  – More efficient use of the whole controller team

• Crossing Restrictions and Altimeter Setting (AS) Service
  – Reduces burden of repetitive tasks on the controller
  – Cross Fix at Altitude
  – Cross Fix at Altitude and Speed

• All Data Comm Services increase Safety by reducing Hear-Back/Read-Back errors
Segment 2 Advanced Services

- Trajectory Based Operations in Performance Based Airspace, providing conflict-free flight with stable aircraft routing
- Conformance Management to ensure aircraft compliance with trajectory
- Optimized Profile Descents and time-based metering
- NAS Airport status, delays and constraints, hazardous weather uplinked to the aircrew
- Taxi-in / Taxi-out service provides taxi routes for aircraft to follow from the gate to the runway
Data Comm ATC Advantages

• Handle increases in traffic more effectively
  – Complicated clearances take seconds to compose allowing more time to think

• More efficient use of the whole controller team
  – Multiple communication points within team
  – D-side, R-side and Tracker/Coordinator position would be able to communicate directly with aircraft

• Increased safety by reducing Hear-Back Read-Back errors
  – ATC clearances cannot be misspoken or acknowledged by another aircraft
Data Comm ATC Advantages

• Enables quicker recovery from bad weather or other TMA situations
  – During periods of severe weather avoidance procedures Data Comm aircraft receive routings without waiting in the voice queue

• Reduce burden of repetitive tasks on the controller
  – Transfer of Communications data message for hand-off of aircraft from sector to sector
  – Routine clearances and advisory information sent by Data Comm
Data Comm Airspace User Advantages

• Fuel
  – Reduce flight times and distance
  – Optimized profile descents

• Schedule
  – Reduce surface delays
  – Improve integrity of flight schedules
  – Quicker recovery from disrupted operations

• Safety
  – Eliminate read back / hear back errors
  – Reduce occurrences of pilot deviations
Avionics Strategy - Alternatives

Alt #1

Air
- Turn-on FANS 1A+/VDL-2
- Forward Fit FANS 1A+/VDL-2
- Forward Fit ATN Baseline 2

Ground
- FANS ground system
- ATN ground system

Alt #2

Air
- Turn-on FANS 1A+/VDL-2
- Forward Fit FANS 1A+/VDL-2
- Forward Fit ATN Baseline 2
- Upgrade to ATN Baseline 1

Ground
- FANS ground system
- ATN ground system
Near Term Events

• **Release Data Comm Integrated Services Screening Information Request (SIR) – 2011**
  – VDL-2 Air-Ground Communications Network Service
  – Integration and Engineering Services
  – Industry Outreach support

• **Revised Departure Clearance (DCL) Trials – 2012**
  – Exercise air operations center, flight deck, and air traffic control operations DCL procedures
  – Planning being done through joint industry-government Data Comm Implementation Team (DCIT)
Questions?
Back Up
Data Comm Trials

• Initial trials will focus on Departure Clearance (DCL) and Clearance Request and Delivery (CRD)

• Coordinates air operations center, flight deck, and air traffic control operations

• Team members include
  – Boeing - FedEx
  – Thales - Continental
  – United - Delta
  – American - Sensis
Coordinating with Industry

• Data Comm Implementation Team
  • Joint government-industry team developing ops procedures for Revised Departure Clearances
  • Participating team members include
    - Boeing
    - Thales
    - United
    - American
    - FedEx
    - Continental
    - Delta
    - Sensis

• American, Continental, Delta, and United willing to participate in DCL trials in 2012/13
## Avionics vs. Capability

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<td>Advanced Services (Trajectory Based Ops, Conf Mgmt, etc.)</td>
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**Note 1:**
No UM73 departure Clearance message, but UM 80 could potentially be made to work

**Note 2:**
Non-FMS integrated implementations limited to simple clearances (e.g. 3 fixes, no lat/longs)

**Note 3:**
CAL not officially part of message set but most implementers have it included