

conne:ion
by Boeing™

Enabling Aviation Security Applications via Broadband Satellite Communication Services



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Connexion by Boeing^S

April 30, 2002

imagine ...

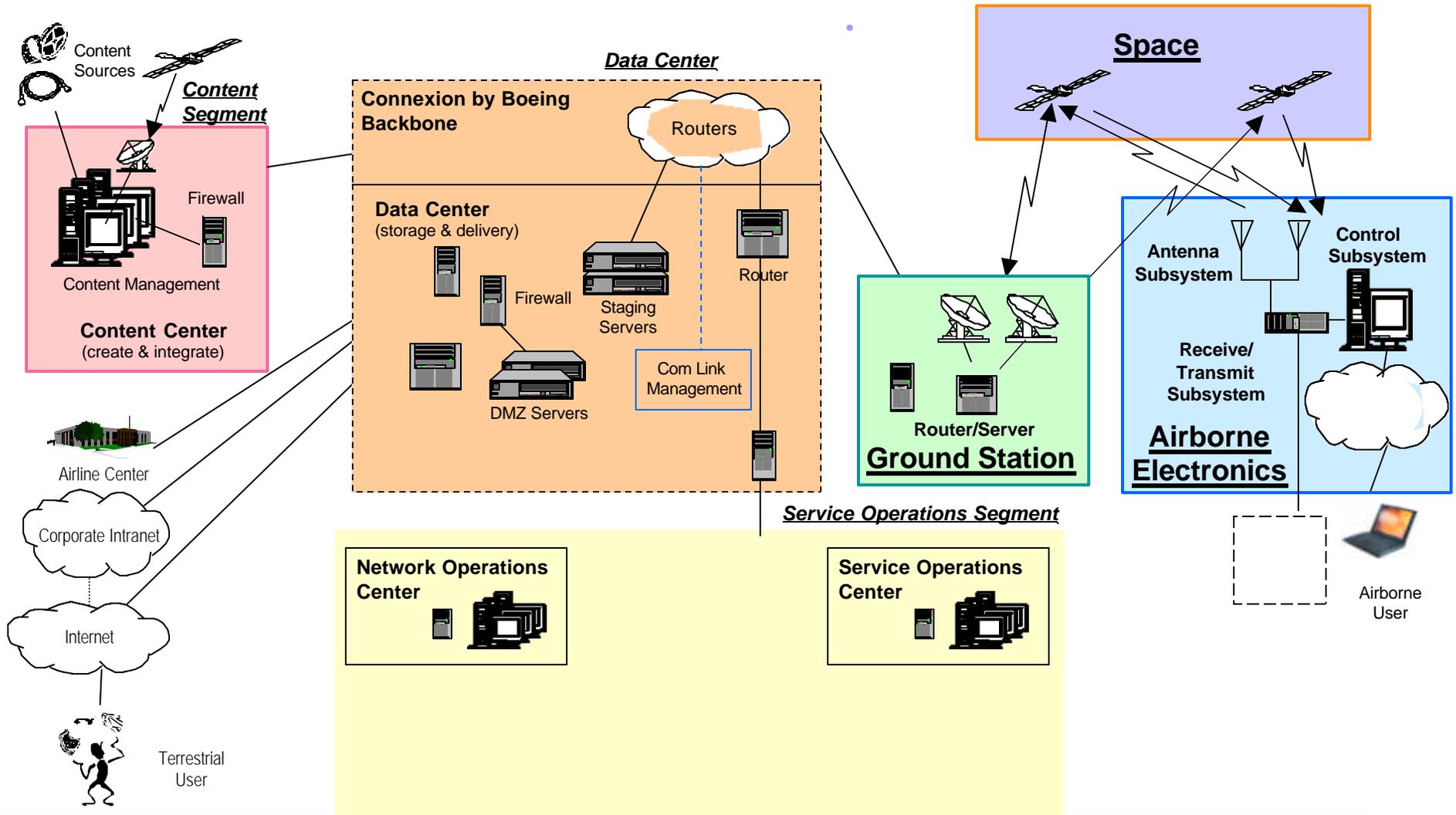
Agenda

- Summary
- Background
- Concept of Operations
- Security Application Demonstrations
- Expected Benefits
- Future Capabilities
- Conclusions

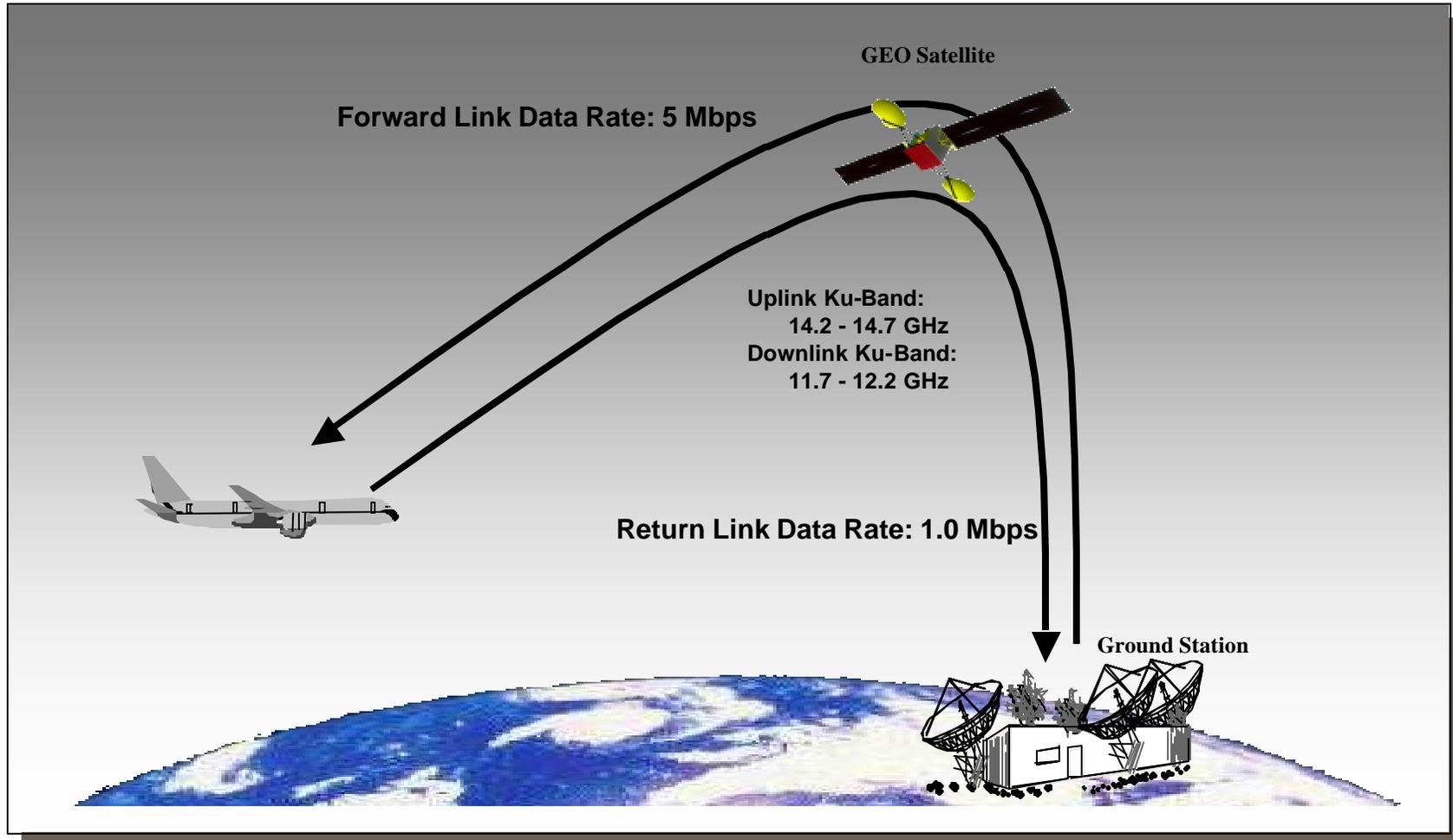
Background

- Boeing developed the airborne phased array antenna.
- Connexion by Boeing established to provide broadband Internet service to aircraft.
- CBB received permanent FCC two-way Ku-band license in December 2001.
- CBB installed first system on commercial airliner (Lufthansa) in March 2002.

CBB FUNCTIONAL SECURITY ARCHITECTURE



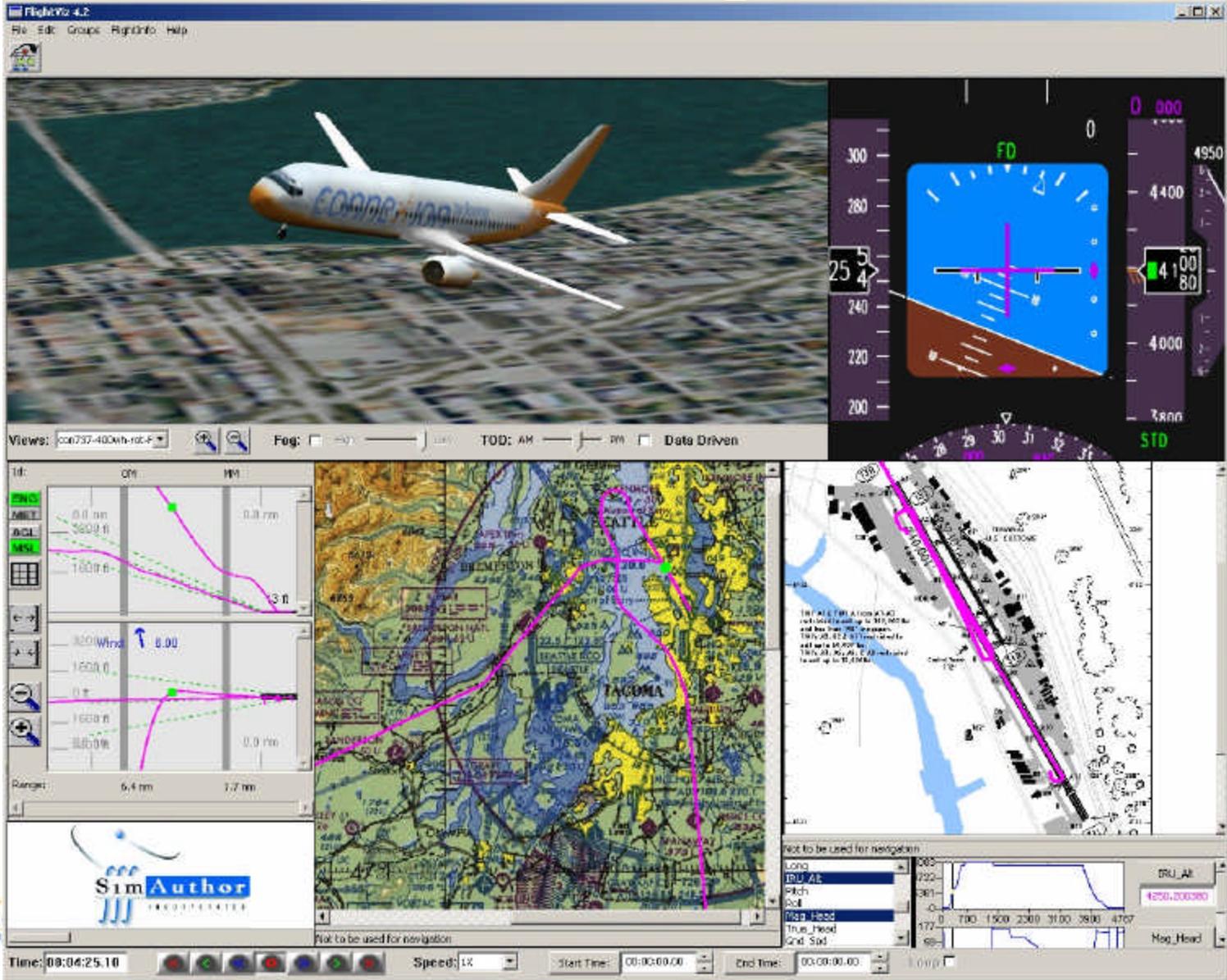
Space Segment Overview



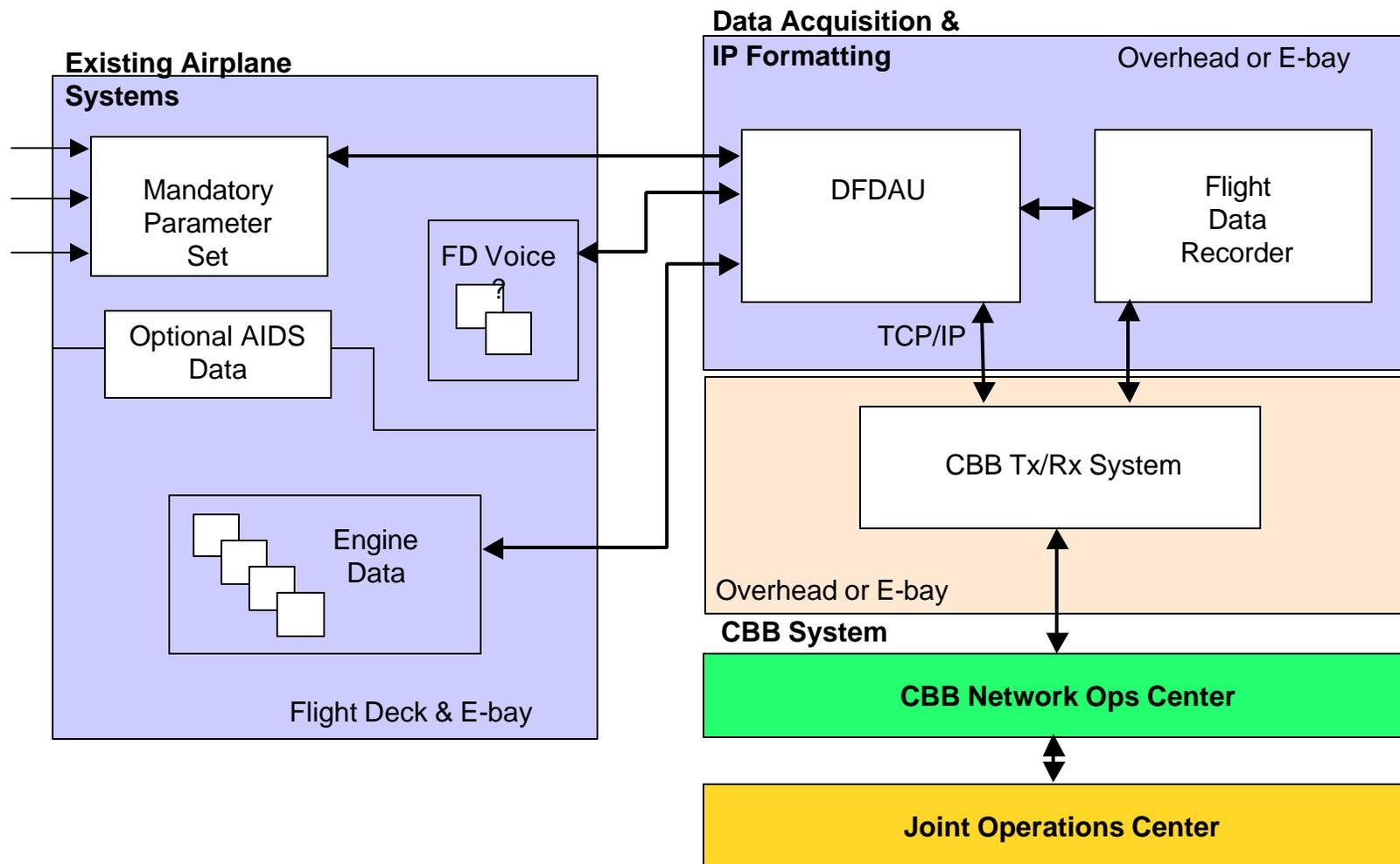
Security Application Demonstrations

- Puget Sound flight tests in November and December, 2001.
- Utilized Connexion - One, our 737-400 engineering test aircraft.
- Demonstrated the feasibility of the following capabilities:
 - Real time in flight video surveillance
 - Flight data monitoring
 - Silent alarm

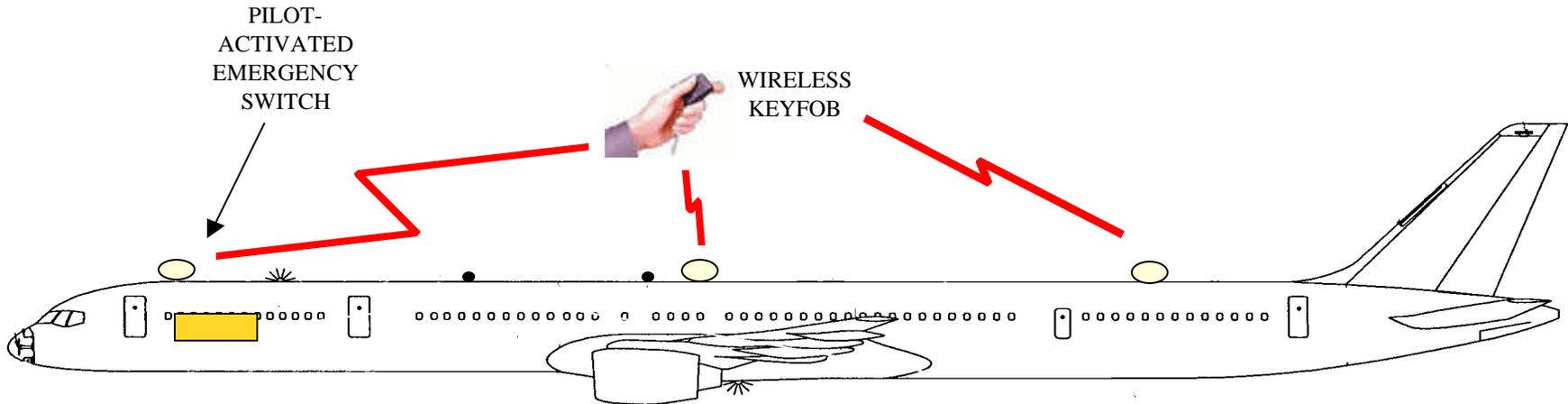
Flight Monitoring in Operations Center using Remote Flight Data



CBB Flight Data Monitor System Block Diagram

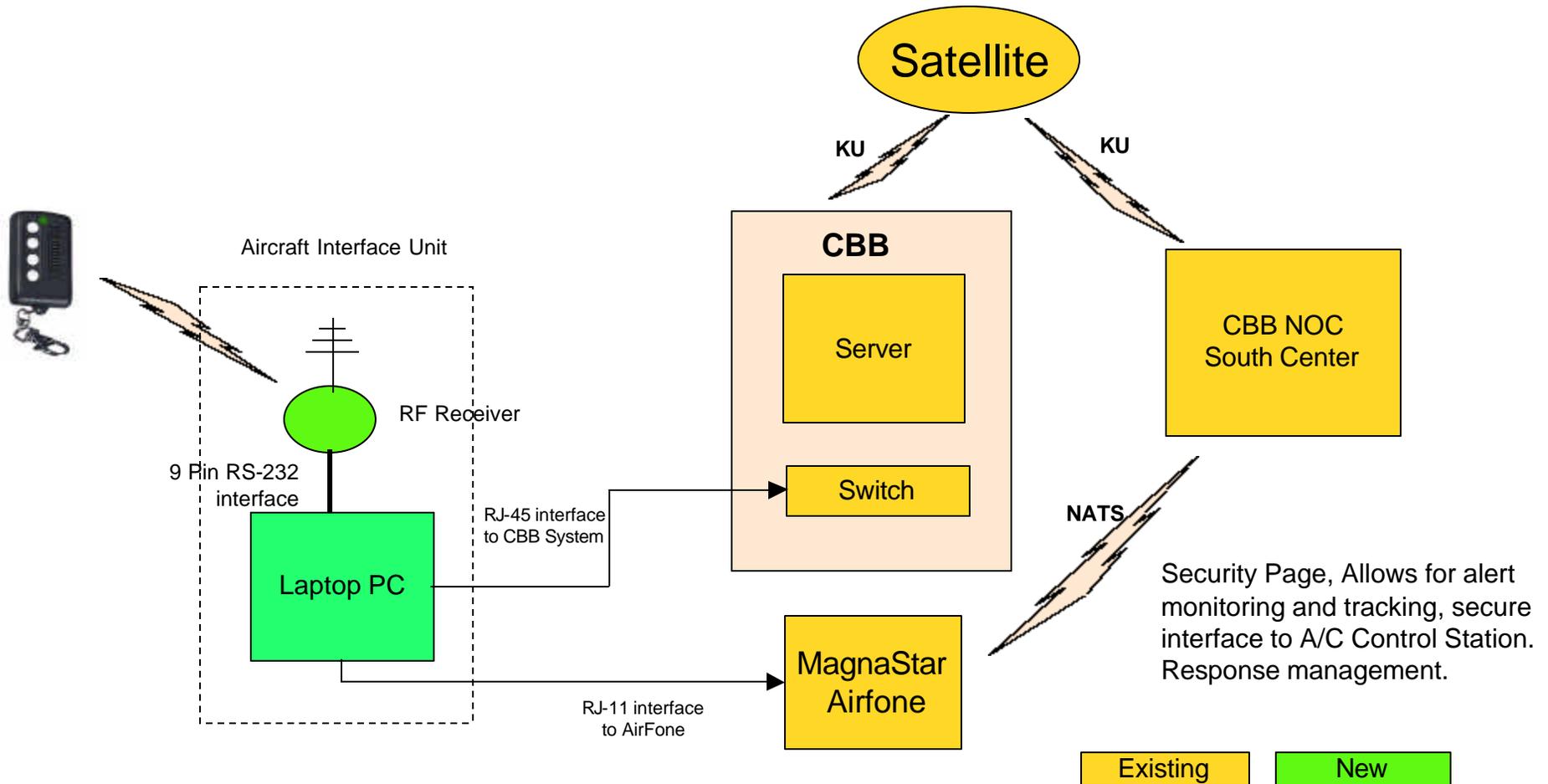


Silent Alarm

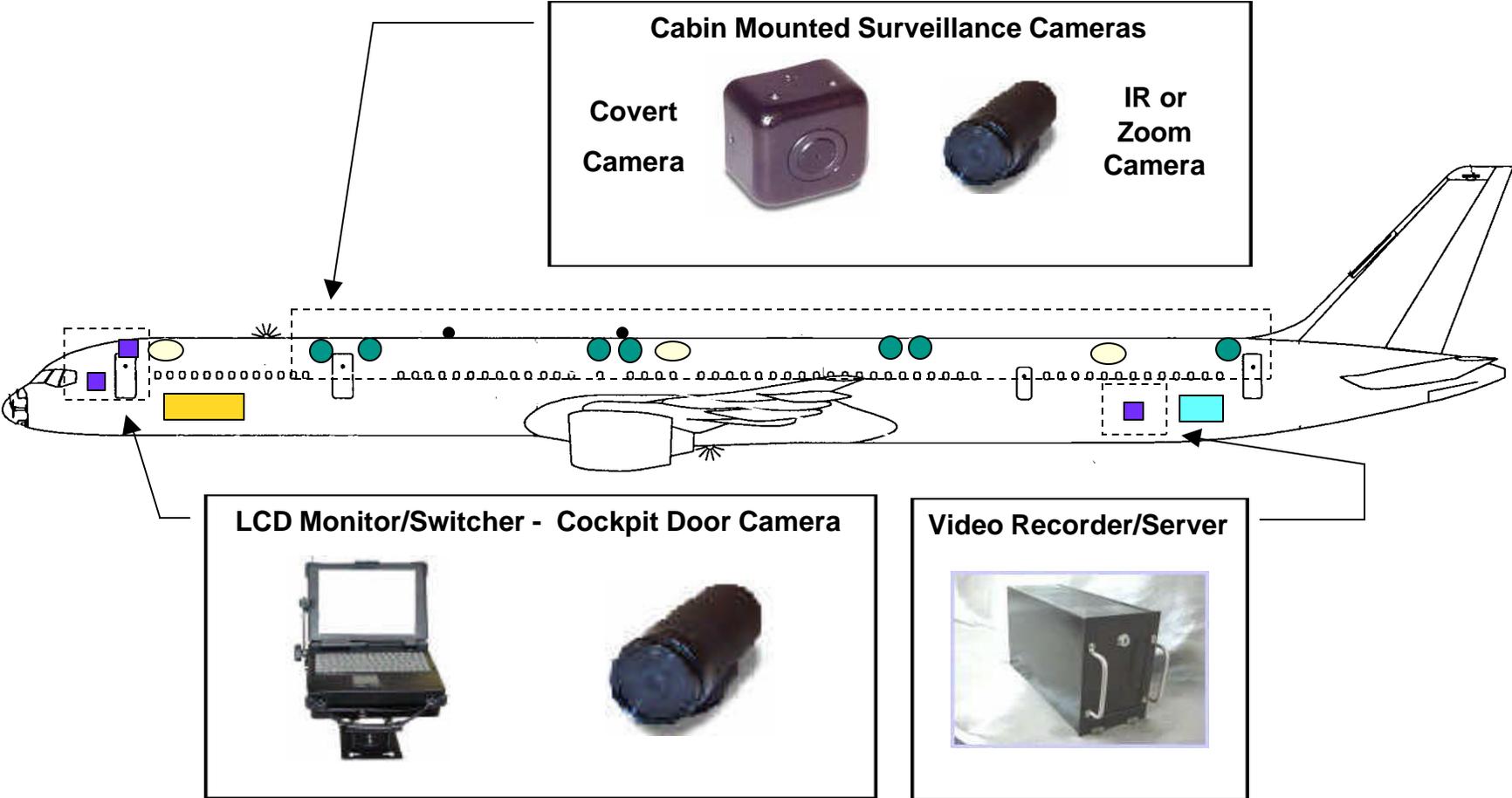


- **Silent Alarm to ground is an alerting system that covertly signals ground personnel of aircraft situations.**
- **Initiated by any crew member or sky marshal by wireless device**
- **The Silent Alarm could interface with existing communications systems and/or be integrated in the CBB system.**

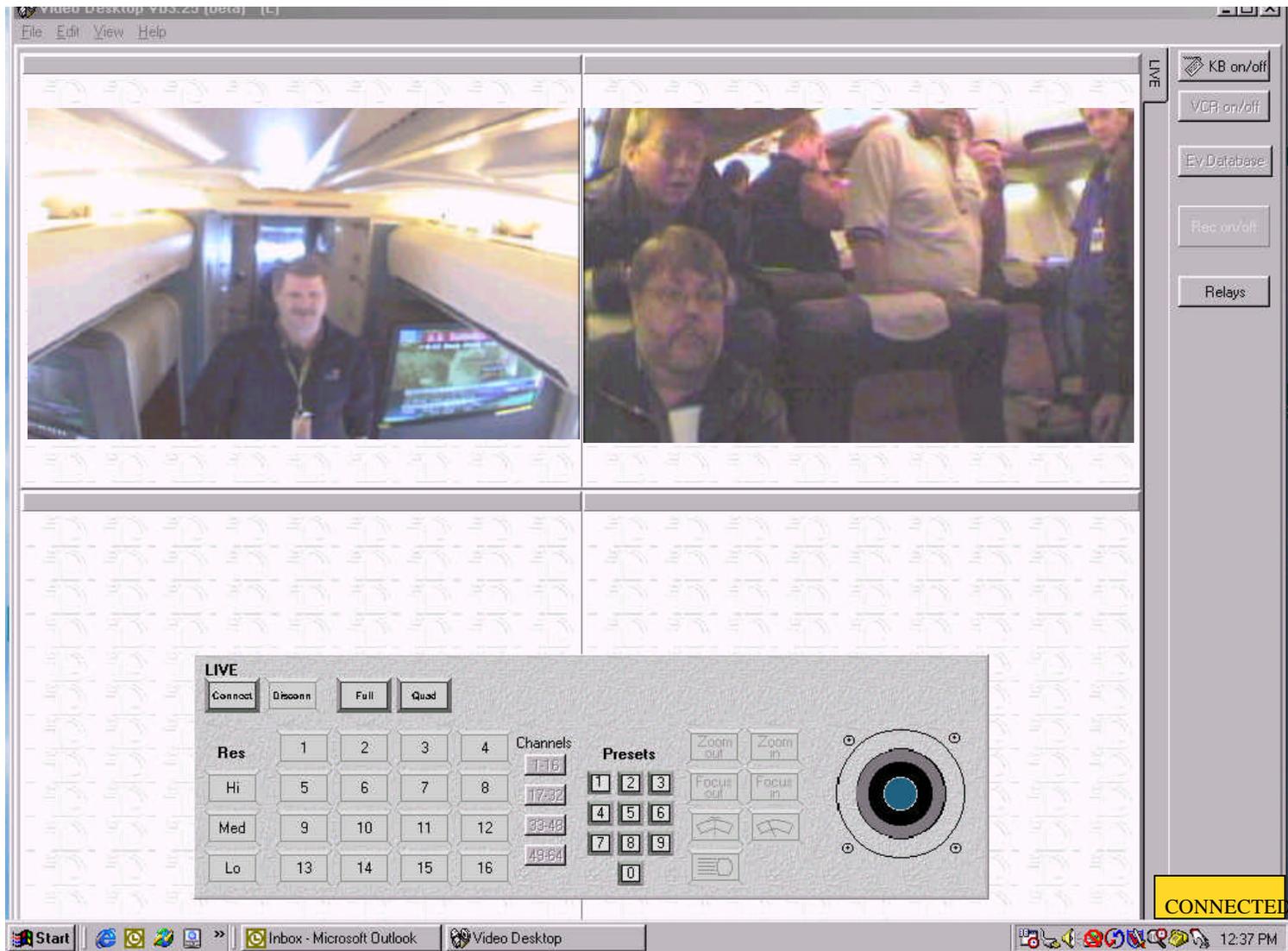
CBB-1 Silent Alarm Demo



Flight Deck/Cabin Video Surveillance System



Real Time Video Surveillance On Demand



Expected Benefits

- Response to abnormal airborne events can be more specific:
 - Currently worst case outcome (ie hijacking) is assumed.
- In flight medical emergencies can be monitored on ground.
- In flight turbulence events can be monitored on ground.
- ETOPs events can be monitored real time on the ground.
 - Flight data monitoring could be activated & given priority.
- Situations with passengers (air rage, etc) can be monitored and recorded on ground.
- System could be last backup to loss of all ATC communications
 - No operational credit for dispatch but:
 - Less impact than scrambling fighters.

Future Capabilities

- Flight Data Monitoring
- Real Time Audio/Video Surveillance of Flight Deck & Cabin
- Silent Alarms to trigger offboard communication
- Threat Identification
- FMC/FMS monitoring & updating
- Communication Monitoring (Virtual Cockpit Voice Recorder)

Conclusions

- Real time semi-automated monitoring with broadband communication is feasible today.
- Ground response to non-normal events could be more informed.
- Would minimize system disruptions and delays caused by current response modes with worst case assumptions.
- Recovery of commercial air transportation depends on effective security solutions.