Future of Airborne Satellite Connectivity Enablement

By Rockwell Collins
Use Case Domains and Product Coverage today

**Flight Operations**
- Dispatch
- Aviate
- Navigate
- Communicate

**Business Operations**
- Passenger Services
- Performance
- Documentation
- Maintenance
- Coordination

**Passenger Connectivity**
- Voice Communication
- Data Communication
- Entertainment
- Information

**Enablement:**
- High safety standard
- Low to medium bandwidth
- Packet based protocols

**In-flight Safety product-line**
- Inmarsat / SBB (low/med)
- Iridium / Next (low/med)
- L-Band based protocols

**In-flight Cabin product-line**
- Low safety standard
- Medium to Very High bandwidth
- IP based protocols

**Ground- Connectivity**
- In Flight- Connectivity

**Ground connectivity**
- Ka (highest speed)
- Ku (high)
- Air-To-Ground (med - high)

**Ground connectivity**
- (If usage does not require real time exchanges)

**In-flight Connectivity**
- (If usage does not require real time exchanges)
Rockwell Collins Inmarsat Solutions’ evolution

ARINC 741 SAT-906/906B
- 3-5 LRU’s / 18-22 MCU
- Cockpit voice and ACARS
- Growth to 1-2 Channels of SBB

ARINC 761 SAT-2100B
- 2-3 LRU’s / 8 -12 MCU
- Cockpit Voice and ACARS
- Growth to 1-2 Channels of SBB/S64

ARINC 781 Antenna
- 1 LRU / 6 MCU
- Cockpit Voice and ACARS
- 1-2 Channels of SBB/S64

ARINC 781 SAT-2200


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Multiple Connectivity Alternatives: Bandwidth vs. Coverage

- Iridium
- Inmarsat Classic
- Inmarsat SBB
- Iridium NEXT
- LDR & SBB safety services
- Ku Band
- ViaSat, EutelSat
- Ka Band
- ViaSat, EutelSat
- AirCell GoGo
- ATG
- Panasonic, ViaSat, AirCell
- Gatelink/3G Cellular
- WiMax LTE
- 3G DSL Cable
- 4G
- 2015 Pax Expectations
- 2012 Pax Expectations
- Row 44
- Swift 64
- Global Xpress™

Data Rate (Mbps):

- Ground
- Inflight Based

Smaller aircraft
Larger aircraft
Minimum aircraft size
Coming
Moving into a period where Cockpit and Cabin Systems are diverging

**I4 Network Enhancement from Inmarsat (First TC for BizJet in 2014):**
- SBB Safety Services (-30% service cost reduction)
- LDR (SWAP-C optimized system, Background IP)
- Helo Waveform compatibility
- HDR (650+ kbps streaming IP)
Bandwidth ‘to Aircraft’ expectation with different trends

- e-mail access,
- SMS,
- Social Networking
- Internet browsing
- Shopping on-line
- EFB

Today

- Skype
- Live-TV / IPTV
- Business VPN
- Download
- Non safety EFB

Tomorrow

- Limited real time EFB safety applications

Future state

- Streamed content
- Cloud computing
- Operations

Safety of flight remote content

Current dual product-line meet expectations and will continue to the end of life of installed platforms

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SB200-S example

Existing A781 6 MCU Solution

New A781 2 MCU Solution (SB200-S)

Class 6

Class 4

Bigger HPA

Typical ARINC 781 Shipset

Compact SwiftBroadband Shipset

Future cockpits
# Inmarsat SATCOM Product Line Status and Roadmap

## 2014
- **SAT-905**
- B Model (single or dual SBB channel)
- Boeing TC
- A350 Cert
- Dual SBB channel
- Available

## 2015
- **SAT-2100B Retrofit**
- B767
- B737, B767, B787
- Available

## 2016
- **SAT-2100**
- B757, B777, BA
- Available

## 2017
- **SAT-2200**
- B747-8, B737, B777
- Single SBB channel
- Available

## 2018
- **SAT-2100B (single or dual SBB channel)**
- A320, A330/40 & B777, BA
- Available

## 2019
- **End Of Production**
- Available

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**SB200-S**
- SB200-S Offering for Business & Regional
- Available

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Very Large Bandwidth protocol will not be qualified for Safety Services
SATCOM CONNECTIVITY SOLUTIONS

QUESTIONS

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