

# **AirCell Presentation to the Federal Communications Commission**

## **A Case for Competitive Access and Broadband Applications within the Air-To-Ground Spectrum**

October 22, 2004  
FCC Docket 03-103

## Introduction

- ➔ **AirCell and Boeing have converged on a common approach for ATG broadband**
  - Responsive to airline desires for broadband and competition
  - Full broadband capability on flexible, shared basis
  - Protection for Airfone legacy service and base stations
  
- ➔ **AirCell and Boeing agree that AirCell's proposal promotes the NPRM's call for innovation, spectrum-efficiency and competition**
  
- ➔ **Proposal builds on prior AirCell innovation and success in FCC-supported spectrum re-use**
  - Opened critical safety and passenger sectors un-served by Airfone
  - Dramatically reduced equipment and service costs to General Aviation
  - ATG is natural home for AirCell customer migration to broadband

## **AirCell Proposal: Summary**

### **→ Offers true BROADBAND competition**

- Each system/operator is isolated from the others
  - Broadband data rates reduced by less than 1% due to inter-system interference
  - Less than 1% probability for SINR degradation of >2dB
- Each operator can offer the same broadband rate to the aircraft and seat as the “monopoly” / single operator case
- Airlines and passengers benefit from ATG competition

### **→ “Off-the-shelf” technology used**

### **→ Full service all the way to the ground (deck-to-deck)**

### **→ Simple rules for spectrum sharing**

## Broadband Network Costs & Transition Plan

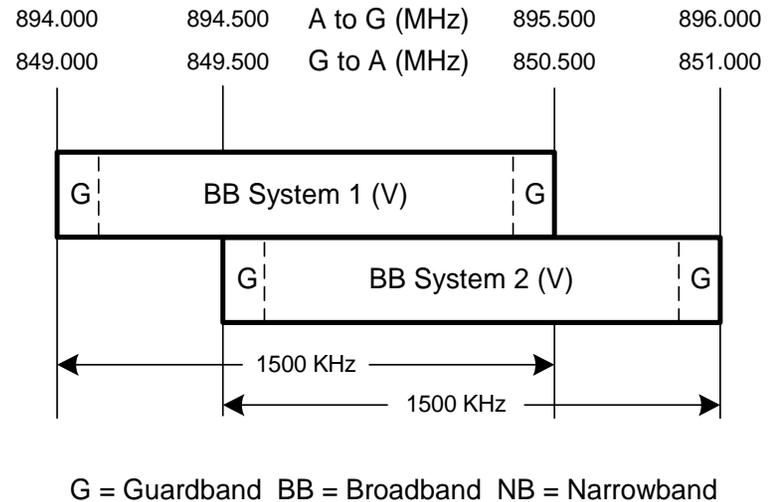
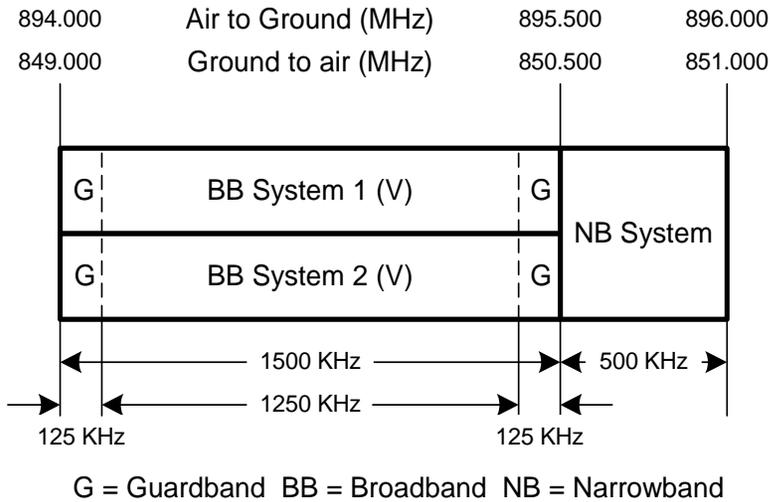
- ✈ **AirCell, Boeing, and Airfone propose the same technology – CDMA**
  - Equipment costs are the same whether there are 1 or 2 operators
  - No special base station or aircraft antennas required
  
- ✈ **Incumbent network transition**
  - Airfone can keep all of its current sites for old & new system
  - Transition bandwidth for incumbent under the AirCell proposal is same as in the “broadband monopoly” scenario
  
- ✈ **Airfone needs only a fraction of 4 MHz for transition**
  - Low utilization of 3900 calls/day\* could be supported by limited channels and small bandwidth

\* Calculation based on Airfone having 1700 commercial aircraft equipped, with 2.3 calls/day/aircraft – as indicated by Airfone President’s statements to the NY Times 10-10-04, Source (1)

## **AirCell Two Carrier Scenario - XP**

- **Utilizes cross-polarization to provide isolation between carriers**
  - AirCell tests and operational experience show 12-15 dB (or more) isolation between horizontally polarized and vertically polarized systems
  - Naval radar not a concern (no reverse banding)
  
- **Utilizes frequency offset isolation once legacy narrowband system is discontinued**
  - Provides additional isolation between the two systems
  
- **Isolation sufficient to allow two system to operate with virtually no intersystem impacts**
  - both broadband
  - both deck-to-deck

# Spectrum Plan



Initial plan, with narrowband system still in operation

Final plan, after narrowband system operation discontinued

## Rule requirements

- **Sites serving same airspace located within 2 miles of each other**
  - Leverage existing reference site list in rule 22.859 to minimize any issues related to agreeing on site locations
  - Airfone can keep all current sites
  - sites can be moved or added by mutual agreement
  
- **Carriers must maintain similar coverage from nearby sites**
  - Similar antennas and transmit powers
  
- **Carriers have option to build/not build any particular site**
  - Transmitter controls potential for near-far interference from low altitude aircraft

## **The false premise ... *Satellite Solutions Offer A Competitive Alternative to Terrestrial Air-to-Ground Telecom***

**Today's facts, including Airfone's strategy<sup>(2)</sup>, clearly indicate that satellite solutions are not a competitive option**

- No U.S. airline has installed satellite communications aboard its narrow-body domestic aircraft
- Satcom weight, drag and cost have only been defensible for transcontinental widebody aircraft
- Verizon Airfone today charges \$4/min + \$4 setup for a terrestrial ATG call, but needs to charge \$10/min + \$10 setup for an Inmarsat satcom call<sup>(3)</sup>
- Iridium & Globalstar – Low cost voice and narrow band data, not able to support broadband telecom features.

## Even considering next generation solutions ...

- Using an ATG CDMA broadband terrestrial link, a passenger will pay less than \$0.50/minute for a voice call and the aircraft system will cost less than \$100K installed.

Whereas ...

- The newest satellite offerings\* will charge \$2-7/min\*\*, with equipment costs ranging from \$500K to well over \$1 million\*\*

\*Inmarsat IV, Connexion by Boeing, Rockwell-Collins eXchange, ARINC/Telenor, ARINC SkyLink

\*\*Sources (4,5,6)

## **Majority of U.S. carriers have elected to not provide Airfone or satellite passenger telecom services**

**Alaska Airlines**

**American Airlines**

**America West**

**ATA**

**AirTran**

Plus all Regional Airlines with the exception of United Express and Midwest Express

**Frontier Airlines**

**Independence Air**

**JetBlue Airways**

**Northwest Airlines**

**Southwest Airlines**

- ➔ **More than 6,400 aircraft are un-served (~79% of the U.S. fleet)<sup>(7)</sup>**
- ➔ **Airlines need competitive offerings and have made that request known to the FCC**
- ➔ **Verizon Wireless customers pay \$0.10 per minute with \$10 Monthly fee or \$0.69 without fee. Everyone else pays \$4.00/minute, plus a \$4.00 set-up charge**

## Market Potential – Inflight Cellular Services

(as compared with Terrestrial Cellular Market)

	U.S Terrestrial Cellular Market	U.S. Inflight Comm Market (at 2004 traffic)
Total Available Market / Potential Users	232 million <sup>(4)</sup> (U.S. pop. ages 15-up)	600 million <sup>(1)</sup> (U.S. enplanements)
Subscribers / Enplanements Served	160 million <sup>(2)</sup>	38 million (est. 80% fleet pen. & 8% uptake)
Customer Access, Hours per Year	934 billion (16 hours per day x 365)	85 million (2.2 hours per flight)
Minutes of Use	813 billion <sup>(2)</sup>	900 million <sup>(3)</sup> (est. voice, SMS & data sessions)
Annual Revenue	\$87.6 billion <sup>(2)</sup>	\$510 million <sup>(3)</sup> (equipment & services)
Total U.S. Network, sites deployed	163,000 <sup>(2)</sup>	480 (four providers)

(1) FAA forecast, 7/15/04    (2) CTIA news release 3/22/04    (3) AirCell estimate  
 (4) CIA Population Fact Book

## Airfone / Telcordia Misstatements

- **Airfone and Telcordia presentations misstate the facts about AirCell's proposals. The truth is:**
- No performance penalty for two systems
  - AirCell is proposing CDMA, which will provide true broadband service
  - AirCell proposal will provide continuous full broadband coverage to the ground
  - Ample flexibility to innovate and evolve in the future with minor coordination requirements
  - Telcordia concerns are based on unrealistic assumptions of two interfering aircraft served 200 miles away from base stations, transmitting at artificially high power levels (20W)
  - AirCell plan does not impose any special costs on broadband ATG providers and allows use of off-the-shelf technology

## Space Data Shortcomings

- Cell phones and WiFi devices do not operate in the ATG spectrum
- Even if expanded frequency range could be made available, cell phones and WiFi devices do not put out sufficient power through the fuselage to reach balloons that can be 12-20 miles in altitude but 100+ miles away from the aircraft
- High power levels from user devices will be virtually impossible to certify with the FAA due to interference with avionics
- With frequency re-use needed, 1 MHz insufficient to meet ATG market demands
- Maintaining an ever-present fleet of balloons properly spaced across the nation is at best costly and at worst impossible

## Consequences of Airfone Proposal

- Exclusive access and pricing for Verizon Wireless customers (\$0.10 or \$0.69 a minute for Verizon customers -- \$4.00/minute, plus a \$4.00 set-up charge for everyone else)
- No ATG partnership opportunity for other wireless carriers
- May limit service options to smaller airlines and general aviation
- Limits airline ability to negotiate best economic deal for itself and its passengers
- Higher consumer prices
- Only competition drives innovation and brings new services to the consumer
- Inefficient use of the only spectrum available for ATG

## Conclusions ...

- **AirCell and Boeing have converged on a common approach for broadband ATG**
- **Proposal supports competition criteria and NPRM requirements**
- **Offers ease of transition from legacy services to broadband**
- **Meets customer and market demands for low cost broadband services**

## **Sources:**

- (1) **Almost here: Cell phones at 37,000 feet, Joe Sharkey, The New York Times, October 10, 2004**  
“William E. Pallone, the president of Verizon Airfone Inc., concedes that those seat-back Airfones are falling out of favor quickly as travelers become more accustomed to fancy technology on the ground. ‘At one time, at prices comparable to where we are today, we had as many as 15 users per aircraft, six or seven times as much usage as we have today,’ he said, suggesting that seat-back phones have become like airport pay phones: useful when you really need them.”
- (2) **Broad Verizon, Inflight Magazine, Autumn 2004**  
“Airfone points out that most US air travel is domestic and regional and says it would be more economically served by a terrestrial infrastructure.” Quoting Airfone’s President ... “Pallone says that acquisition, installation and support costs will be significantly less than those of satellite systems.”
- (3) **United Airlines seatback magazine**
- (4) **Satcom Shakeout, Fred George, as published in Business & Commercial Aviation, September 2004**
- (5) **The Activist Passenger, Michael Mecham, Aviation Week & Space Technology, September 27, 2004**
- (6) **Taking the Connexion, Inflight Magazine, Autumn 2004**
- (7) **FAA data indicates 8,118 total U.S. commercial aircraft. Calculating 1,700 as Airfone-equipped, resulting in 6,418 or 79% un-served.**