

# Telecommunications Law Update

OCTOBER 27, 2004

## Airline Spectrum Issues: Can Wireless Take Off?

Several innovative new wireless services have grabbed the attention of the airline industry. Some of these will allow airline customers to access the Internet or use their mobile phones while in-flight. These should provide the airlines with new revenue flows, while also providing some efficient computing and communications solutions for the airlines themselves. At the same time, however, these and other new technologies can pose interference challenges that could affect airline safety. For example, new wireless technologies used in some handheld electronic devices and laptop computers could interfere with airline navigation systems. We describe here just some of the Federal Communications Commission ("FCC") and Federal Aviation Administration ("FAA") proceedings and investigations that the airline and wireless industries should be watching closely.

### Cell Phones in the Sky

A number of companies are developing technologies that would allow airline passengers to make and receive calls using their own mobile phones while in-flight. One such technology, supported by AirCell, is currently before the FCC

in the "Air-to-Ground" ("ATG") proceeding, discussed below. Competitors claim that AirCell's technology could disrupt terrestrial cellular networks, and the FCC reportedly is skeptical that AirCell has adequately addressed these concerns. FCC rules today prohibit the use of cell phones in planes precisely because of potential cellular network interference issues.

The FCC and FAA are also looking at other promising nascent technologies for in-flight phones. Qualcomm, for example, has recently demonstrated a system that would allow its existing CDMA mobile phones to connect to a low power ("picocell") base station on an airplane, which would in turn connect to terrestrial voice (and broadband Internet) services via a satellite link. To date, existing air-to-ground voice services have not been very popular; new technologies that provide higher quality (and potentially more economical) service might fare better.

### In-Flight Broadband

In-flight broadband is probably the most exciting new wireless service for the airline industry. The ability to surf the Web from the

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seat of a plane offers passengers a myriad of entertainment and business applications. In-flight broadband Internet access also would facilitate in-flight voice communications using Voice-over-Internet-Protocol (“VoIP”). In addition, in-flight broadband may have useful and cost-saving commercial applications for the airlines themselves. For example, software is now available to use a broadband in-air connection to relay in-flight mechanical status information to the ground team, allowing diagnostics to be performed while a plane is in the air. This greatly reduces the time needed to perform service and repairs on the ground.

Some in-flight broadband services already are available, such as the satellite-based Connexion, offered by Boeing, and SKYLink, offered by Aeronautical Radio, Inc. U.S. airlines, still recovering from industry-wide financial difficulties, have not yet rushed to invest in the technology. However, Boeing’s service is now available (or will be available soon) on a number of international flights, especially in Asia.

Another option for in-flight broadband that may be offered soon is a new generation of air-to-ground broadband technology that does not rely on satellites. The FCC is now considering several ATG proposals. The debate at the FCC centers on whether there is a technological solution that will allow multi-competitor broadband entry without degrading service quality. At issue is a narrow bit of spectrum at the 800 MHz range that was previously divided among several companies that provided seat-back phone services. Verizon AirFone (the remaining seat-back phone service licensee in the 800 MHz band) maintains that exclusive rights to most of the available band would be required to offer a workable broadband service. Boeing and AirCell, in contrast, contend that the spectrum can support more providers, using overlapping frequencies; they have submitted a technological proposal

for that approach. Airlines such as Frontier and AirTran have voiced support for any approach that allows the entry of more competitors, which they say would result in improved service and lower prices. A draft order providing for only a single license is said to be circulating among the Commissioners already. However, even under this approach, the FCC reportedly is considering several methods of allowing multiple carriers to provide ATG service, including allowing resale or leasing of spectrum in the 800 MHz band or identifying additional suitable spectrum outside the band.

FCC Chairman Michael Powell had hoped for a November vote. Recently, however, a number of parties have asked for a delay, citing concerns such as the possibility of interference with adjacent bands of spectrum dedicated for public safety uses. A resolution of the ATG service issues therefore may not be imminent, but at some point, the ATG proceeding promises to chart the course for competitive, in-flight broadband services.

### **Interference in the Air**

As noted above, interference from consumer electronic devices and new wireless technologies has become a growing concern to the airline industry. This is especially true as technologies evolve that are designed to allow co-uses of spectrum in place of distinct bands for different applications. To best resolve concerns about interference with airline communications and navigation systems, the FCC and the FAA must cooperate, which those agencies have not always successfully done. Those agencies already are considering each of the following interference issues:

- **In-Flight Wi-Fi.** Most in-flight broadband technologies anticipate using Wi-Fi technology to allow passengers (and the crew) to connect their laptops and other devices to a central broadband

“connection” on the plane. At the request of the FAA, RTCA, Inc. (a private non-profit corporation that functions as an advisory committee to the FAA on communications and air traffic issues) is currently studying the effect of Wi-Fi devices in flight and is drafting a recommendation on updating the FAA rules.

- Ultra-Wideband (“UWB”). Previously, the airlines’ surveillance and weather radars, microwave landing systems, and radar altimeters used dedicated spectrum that ensured a clear signal. However, the FCC’s February 2002 order authorizing unlicensed low-emissions UWB devices at 3.1-10.6 GHz now compels the airlines to share some of that spectrum with consumer electronic devices, among other things. Consumer electronics manufacturers argued that emissions from consumer electronic devices would likely be too low to interfere with airline systems, and the FCC agreed. As a result, consumer electronics manufacturers plan to launch some UWB-based devices later this year. But empirical tests done by NASA apparently suggest that navigation and landing systems can behave erratically when exposed to frequency-modulated UWB transmissions from inside the airplane. The FAA has been conducting its own tests and RTCA, Inc. plans tests soon.
- Consumer Electronics Standardization. In light of these and other interference concerns, consumer electronics companies are attempting to develop standardized “transmitter disabled” language and screen icons in order to assist flight attendants to confirm that

transmitters are switched off during flight. The Association of Flight Attendants has recently recommended waiting for the consumer electronics industry to develop standardized practices before the airlines develop their own guidelines on the use of personal wireless devices in-flight.

- Interference from External Sources. New technologies outside the aircraft cabin also threaten to interfere with aeronautical communication systems. For example, emissions from new technologies that will enable broadband access to the Internet over electrical power lines could pose a threat to airline safety. This was one of the concerns that led the FCC recently to establish “excluded frequency bands” in which powerline broadband providers are not permitted to operate. It remains to be seen whether the FCC’s action will be sufficient: Even where the FCC has not permitted devices to operate on bands overlapping those used for airline navigation, concerns have lingered because out-of-band (“OOB”) emissions can degrade signal strength of the GPS and other systems airlines rely on for navigation.

### **Airport Spectrum**

Wi-Fi has been at the center of another airline-industry debate. Many airlines use or have explored using Wi-Fi for internal or logistical purposes, such as baggage tracking or internal communications; private retailers in airports also have sought to offer Wi-Fi to consumers within their premises (coffee shops with hot spots, for example). In both cases, airport landlords have protested, contending that only the airport itself may operate a Wi-Fi network. The airports argue that the airport authority must manage unlicensed

spectrum use within the airport in order to oversee interference issues. Repeated disputes over these issues prompted the FCC to issue a public notice earlier this year clarifying that the FCC has exclusive authority, even in airports, over interference issues relating to unlicensed devices such as Wi-Fi. The FCC's action seems to have silenced the debate for now, but as wireless devices proliferate, it may be forced to examine the issue in more detail. A petition for declaratory rulemaking on this issue remains pending at the FCC, but was never put out for comment.

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