

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
Amendment of the Commission's Rules to) WT Docket No. 04-435
Facilitate the Use of Cellular Telephones and)
other Wireless Devices Aboard Airborne Aircraft.)

NOTICE OF PROPOSED RULE MAKING

Adopted: December 15, 2004

Released: February 15, 2005

Comment Date: [30 days after publication in the Federal Register]

Reply Comment Date: [60 days after publication in the Federal Register]

By the Commission: Chairman Powell and Commissioner Copps issuing separate statements.

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I. INTRODUCTION: FACILITATING THE USE OF WIRELESS HANDSETS ON AIRCRAFT

1. In this *Notice of Proposed Rulemaking*, we propose to replace or relax our ban on airborne usage of 800 MHz cellular handsets as well as propose other steps to facilitate the use of wireless handsets and devices, including those used for broadband applications, on airborne aircraft in appropriate circumstances. Section 22.925 of the Commission's rules currently prohibits the airborne use of 800 MHz cellular telephones, including the use of such phones on commercial and private aircraft.¹ Similarly, Section 90.423 restricts the use of Specialized Mobile Radio (SMR) handsets while airborne in certain circumstances.² While Personal Communications Services (PCS) under Part 24 and Wireless Communications Services (WCS) under Part 27 are not subject to an airborne use prohibition by Commission rules, regulations promulgated by the Federal Aviation Administration (FAA) prohibit the use of all types of mobile telephones, as well as other portable electronic devices (PEDs), on aircraft, unless the aircraft operator has determined that the use of the PED (including mobile/cellular telephones) will not interfere with the aircraft's aviation navigation and communication systems. As such, only the aircraft operator acting in accordance with FAA regulations can determine whether passengers aboard aircraft will be allowed to use the electronic devices, including cellular telephones, while the aircraft is airborne. The Commission's restrictions on the airborne use of wireless handsets stem from the potential that unwanted emissions could cause harmful interference to terrestrial-based systems.³ On the other hand, the FAA is concerned with the possibility that PEDs could interfere with aircraft communications and navigation systems.

2. We believe that our actions today will benefit consumers by adding to future and existing air-ground communications options that will provide greater access for mobile voice and broadband services during flight. We also believe that allowing controlled use of cellular handsets and other wireless devices in airborne aircraft would be consistent with the Commission's efforts to promote homeland security by increasing communications options available for public safety and homeland security personnel.⁴ In the event of an emergency, for example, emergency responders and other public safety personnel would have

¹ See 47 C.F.R. § 22.925. The rule reads in its entirety as follows:

Cellular telephones installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated while such aircraft are airborne (not touching the ground). When any aircraft leaves the ground, all cellular telephones onboard that aircraft must be turned off. The following notice must be posted on or near each cellular telephone installed in any aircraft:

"The use of cellular telephones while this aircraft is airborne is prohibited by FCC rules, and the violation of this rule could result in suspension of service and/or a fine. The use of cellular telephones while this aircraft is on the ground is subject to FAA regulations."

² See 47 C.F.R. § 90.423.

³ Terrestrial-based systems refers to communications systems that have base stations on the ground.

⁴ See Federal Communications Commission, Strategic Plan FY 2003-FY 2008, available at <http://www.fcc.gov/omd/strategicplan/strategicplan2003-2008.pdf> (*Strategic Plan*). One of the Commission's stated goals in the *Strategic Plan* is to promote homeland security by promoting effective communications services by and between public safety, public health, and other emergency and defense personnel in emergency situations.

greater ability to engage in direct air-to-ground communications.

3. In initiating this *Notice*, we seek to minimize the potential for harmful interference to terrestrial systems while providing maximum flexibility to wireless telecommunications carriers seeking to address consumer demand for air-ground connectivity. Ultimately, our objective is to relax or remove the Commission's prohibition on the airborne use of cellular telephones. Any steps we ultimately take will leave the use of personal electronic devices (including cellular and other wireless handsets) aboard aircraft subject to the rules and policies of the FAA and aircraft operators. By initiating this proceeding, it is not our intention to affect ongoing efforts by the FAA to examine its own rules and policies, but is part of a collaborative effort to ensure that our rules and policies are designed to complement such efforts and address issues unique to wireless service providers under the Commission's regulatory jurisdiction. In fact, because the FAA is the expert agency responsible for aviation safety, any rule changes that the Commission might adopt in this proceeding would not legally affect the applicability of the FAA's rules and policies. Therefore, even if we modify the limitations on Part 22 and Part 90 devices or adopt other rules pertaining to airborne use of wireless equipment, we must emphasize that airborne use of such equipment will not be allowed unless it is in accordance with FAA rules and requirements. Nonetheless, we believe that it is important to explore changes to our regulations that could eventually allow for the use of such devices, provided that the FAA eventually determines such use to be consistent with aviation safety.

4. Below, we explore several different options for allowing airborne use of wireless devices.⁵ First, because standard "off the shelf" wireless handsets operating on aircraft without pico cells installed will operate at full power, we propose to permit the airborne operation of such handsets so long as they are operating under the control of an onboard "pico cell" that directs the handsets to operate at or near their lowest applicable power settings (for example, the lowest power setting in the IS-95 standard [CDMA] is -50 dBm).⁶ In this connection, we ask whether our proposal should apply only to handsets operating on 800 MHz cellular spectrum covered by the current Part 22 rule (Channel Block A: 869-880 MHz paired with 824-835 MHz, and 890-891.5 MHz paired with 845-846.5 MHz; Channel Block B: 880-890 MHz paired with 835-845 MHz, and 891.5-894 MHz paired with 846.5-849 MHz), or whether any restrictions we adopt should be expanded to include handsets and devices operating on spectrum bands under Part 24 or Part 27.⁷ Second, we seek comment on ways that the 800 MHz cellular spectrum could be used to provide a communications "pipe" between airborne aircraft and the ground. In particular, we seek comment on whether our prohibition on airborne cellular use could be replaced by an industry-

⁵ We again note that the proposals made in this *Notice* relate to our rules only and do not affect FAA rules and policies regarding airborne operation of wireless devices.

⁶ See *infra*, para. 14. Any operation of "off-the-shelf" wireless handsets under the control of a "pico cell" must not allow unwanted radio frequency (RF) emissions to interfere with aircraft navigation and communications equipment, and as stated, installation of the "pico cell" on the aircraft must also be approved by the FAA. We note that our use of the term "handset" in this discussion is not intended to limit technological development of other personal electronic devices that could use 800 MHz cellular spectrum.

⁷ Unlike the Cellular Radiotelephone Service, which has detailed technical and operational rules, the rules for PCS and WCS are geared toward flexible uses of spectrum and allow licensees to offer any type of service they deem appropriate, with certain exceptions. In order to promote flexibility, the Commission did not apply the same level of technical specificity to Parts 24 and 27 as it had to the cellular rules, and the issue of airborne use of handsets was not specifically raised with respect to PCS and WCS.

developed standard that would guard against harmful interference to airborne⁸ and terrestrial systems through appropriate technical and operational limitations. Finally, we seek comment on whether to amend our rules to allow cellular licensees to provide service on a secondary basis to airborne units subject to technical limitations aimed at preventing harmful interference to airborne and terrestrial cellular service.

II. BACKGROUND

5. As an initial matter, we note that the inquiry we are continuing here began as part of the Air-Ground rulemaking proceeding.⁹ Although we are concurrently adopting a *Report and Order* in that proceeding concerning the 800 MHz Air-Ground Service,¹⁰ we determined that the subject of allowing use of cellular handsets on aircraft should be addressed separately.¹¹

6. In 1991, the Commission adopted the current Part 22 prohibition on using 800 MHz cellular phones while airborne.¹² The rule prevents the airborne use of cellular phones carried onboard by passengers or crew members, as well as use of cellular equipment that might be installed permanently, on both private and commercial aircraft. The ban was adopted in order to guard against the threat of harmful interference from airborne use of cellular phones to terrestrial cellular networks.¹³ In a regular terrestrial call, a cellular handset usually communicates through the nearest cell site that can serve it. The farther the signal from the handset travels, the weaker it becomes as its energy spreads out and is attenuated by terrain and obstacles, such as buildings, and is blocked by the curvature of the earth. Consequently, a handset signal is normally too weak to cause co-channel interference at other, more distant, cell sites, and

⁸ As noted, the purpose behind the Commission's ban on airborne cellular use is the prevention of harmful interference to terrestrial cellular systems. However, an industry standard or technical solution that would enable the relaxation or removal of section 22.925 might also be used successfully to prevent harmful interference to aviation navigation and communications systems. We are mindful that if effective solutions are not found to the potential problem of interference to the communications and navigation systems on aircraft, then the FAA's safety rules will continue to prohibit use of cell phones and, thus, our proposed action cannot make a change to the current FAA restriction for the use of cell phones on aircraft.

⁹ Amendment of Part 22 of the Commission's Rules To Benefit the Consumers of Air-Ground Telecommunications Services; Biennial Regulatory Review--Amendment of Parts 1, 22, and 90 of the Commission's Rules, *Notice of Proposed Rulemaking*, WT Docket No. 03-103, 18 FCC Rcd 8380 (2003) (*Air-Ground Notice*).

¹⁰ Amendment of Part 22 of the Commission's Rules To Benefit the Consumers of Air-Ground Telecommunications Services; Biennial Regulatory Review--Amendment of Parts 1, 22, and 90 of the Commission's Rules, WT Docket No. 03-103, *Report and Order* (Adopted Dec. 15, 2004). There are four megahertz of dedicated commercial air-ground spectrum in the 800 MHz band at 849-851 MHz and 894-896 MHz.

¹¹ Therefore, reference or citations to commenters are derived from comments filed in the Air-Ground proceeding, which are incorporated by reference in the instant *Notice*.

¹² Amendment of Sections of Part 22 of the Commission's Rules in the Matter of Airborne Use of Cellular Telephones and the Use of Cell Enhancers in the Domestic Public Cellular Radio Service, *Report and Order*, 7 FCC Rcd 23 (1991) (*Airborne Use of Cellular Telephones Report and Order*).

¹³ *Airborne Use of Cellular Telephones Report and Order*, 7 FCC Rcd at 23 ¶ 5. In this order, the Commission did not consider the potential impact on aircraft navigation or communications systems.

this allows the same frequency to be used by those cell sites to carry cellular calls from other handsets. This principle, called frequency re-use, is the fundamental characteristic of cellular system design that leads to efficient spectrum use. By contrast, if a cellular call were to be made from a handset on an airborne aircraft, the handset signal could be strong enough to cause co-channel interference at multiple cell sites.¹⁴ This is because, even though the airborne handset signal becomes weaker as its energy is spread out, unlike the terrestrial case, it is not attenuated by terrain and obstacles, and it is not blocked by the curvature of the earth.¹⁵ Thus, the signal from an airborne handset may remain sufficiently strong to cause harmful interference or other undesirable effects (e.g., a large increase in noise) at cell sites other than the one that is in communication with the airborne handset.

7. An exception to Section 22.925's strict prohibition against airborne cellular use was made when AirCell, Inc. (AirCell) demonstrated that its equipment would not cause harmful interference to terrestrial cellular systems.¹⁶ On October 9, 1997, AirCell filed a petition for waiver of the airborne cellular prohibition rule, to allow it to resell cellular service to airborne customers using its specially designed equipment.¹⁷ With the waiver request, AirCell submitted an engineering analysis of data gathered in tests in support of its contention that its airborne cellular telephones do not cause interference to terrestrial cellular service.¹⁸ After consideration of the record in that proceeding, on December 24, 1998, the Wireless Telecommunications Bureau (Bureau) issued the *AirCell Bureau Order*, granting AirCell and its participating cellular licensees a waiver of our airborne cellular prohibition. AirCell's waiver request was granted subject to certain special conditions, and accompanied by a list of non-mandatory "Illustrative Technical and Operational Characteristics," that reflected AirCell normal operating parameters as measured or observed during the Texas tests.¹⁹ The Bureau found that operation in accordance with the Texas tests poses very little chance of interference to ground systems, which the waived rule was intended to prevent.²⁰ In addition to the elements of the AirCell system intentionally designed and implemented to prevent harmful interference to cellular operations, the Bureau imposed

¹⁴ *Airborne Use of Cellular Telephones Report and Order*, 7 FCC Rcd at 23 ¶ 5.

¹⁵ These factors also explain why placing a transmit antenna on a taller tower produces a signal strong enough to be satisfactorily received at a more distant location than with a shorter tower.

¹⁶ AirCell, Inc.; Petition, Pursuant to Section 7 of the Act, For a Waiver of the Airborne Cellular Rule, or in the Alternative, For a Declaratory Ruling, *Order*, 14 FCC Rcd 806 (1998) (*AirCell Bureau Order*), recon. granted in part, denied in part, *Order on Reconsideration*, 14 FCC Rcd 18430 (1999) (*AirCell Reconsideration Order*), app. for rev. denied, *Memorandum Opinion and Order*, 15 FCC Rcd 9622 (2000), pet. for rev. granted in part, denied in part sub nom. *AT&T Wireless Svcs., Inc. v. FCC*, 270 F.3d 959 (D.C. Cir. 2001), pet. for reh'g denied Jan. 29, 2002, *Order on Remand*, 18 FCC Rcd 1926 (2003), pet. for rev. denies sub nom. *AT&T Wireless Svcs., Inc. v. FCC*, 365 F.3d 1095 (D.C. Cir. 2004).

¹⁷ AirCell, Inc.; Petition, Pursuant to Section 7 of the Act, For a Waiver of the Airborne Cellular Rule, or in the Alternative, For a Declaratory Ruling (filed Oct. 9, 1997).

¹⁸ A series of flight tests of the AirCell system over a rural area of Texas and Oklahoma (the Texas tests) produced received signal strength and other data. These tests were conducted cooperatively and jointly by AirCell and three major cellular licensees, and observed by Commission engineers.

¹⁹ The illustrative technical and operational characteristics appear in Appendix B to the *AirCell Bureau Order*.

²⁰ *AirCell Bureau Order*, 14 FCC Rcd at 811-812 ¶ 14.

limitations on the operation of the AirCell system to protect further against the risk of interference to terrestrial systems.²¹ The *AirCell Reconsideration Order*, released on July 30, 1999, clarified and revised certain aspects of the *AirCell Bureau Order*. While generally affirming the grant of the waiver to AirCell, the *AirCell Reconsideration Order* clarified the permissible content of the coordination notification and reduces the notification distance from 270 kilometers (168 miles) to 151 kilometers (94 miles).²²

8. As noted above, while the Commission has prohibited airborne use of 800 MHz cellular equipment in Part 22, there is no similar Commission restriction on airborne Personal Communications Services (PCS) governed by Part 24 of the rules or Wireless Communications Services (WCS) authorized under Part 27.²³ With respect to land mobile radio services regulated under Part 90 of the Commission's rules, including SMR operation, Section 90.423 permits only limited airborne use, provided generally that: (1) operations are limited to aircraft that are regularly flown at altitudes below 1.6 kilometers (1 mile); (2) transmitter output power does not exceed 10 watts; (3) operations are secondary to terrestrial systems; and (4) other steps are taken as necessary to minimize interference with terrestrial systems.²⁴ The altitude restriction essentially bans Part 90 land mobile radio use on commercial airline flights, which are usually flown at heights much greater than one mile.²⁵ Airborne use is also permitted under Part 90 in additional limited situations.²⁶ These rules were enacted in order to prevent interference with land-based operations by the use of land mobile frequencies aboard high-flying aircraft, especially aircraft operated by scheduled passenger airlines.²⁷

9. Also as noted above, among other things, the FAA regulates the use of PEDs, including mobile telephones, on aircraft in order to ensure aviation safety. To that end, the FAA has issued regulations including Sections 91.21, 121.306, 125.204, and 135.144 of the FAA's rules, which prohibit the use of PEDs aboard aircraft unless the operator, or certificate holder in the case of an air carrier, verify that the use of any PED will not interfere with the aircraft's communications and navigation systems.²⁸ In particular, the FAA is concerned with the potential for PEDs to interfere with aircraft communications

²¹ See *AirCell Bureau Order*, 14 FCC Rcd at 811 ¶ 13. For example, AirCell and its partners must operate on a secondary basis, and the cellular partners must cure all harmful interference caused by AirCell operations or cease operating immediately. In addition, the Commission set a coordination notification distance of 168 miles. *Id.*, 14 FCC Rcd at 817-818 ¶ 23.

²² *AirCell Reconsideration Order*, 14 FCC Rcd at 18437-39 ¶¶ 14-16.

²³ In these flexible services in Parts 24 and 27, rules allow the licensee to provide any type of fixed or mobile service, including air-ground service.

²⁴ See 47 C.F.R. § 90.423(a). We note that these limits were devised with two-way dispatch systems in mind, not systems with cellular architecture.

²⁵ Of course, even in situations where the Commission's rules permit the use of such devices in airborne aircraft, the FAA's rules prohibit use of such devices unless the aircraft operator determines that the device will not interfere with the aircraft's communications and navigation systems.

²⁶ See 47 C.F.R. § 90.423(b)-(d).

²⁷ See Amendment of Parts 89, 91, and 93 of the Commission's Rules Concerning Use of Land Mobile Frequencies Aboard Aircraft, *Report and Order*, 42 F.C.C.2d 505 ¶ 2 (1973).

²⁸ 14 C.F.R. §§ 91.21, 121.306, 125.204, and 135.144.

and navigation equipment.²⁹ Section 91.21 of the FAA rules, as supplemented by an advisory circular, prohibits the operation of all PEDs, including cellular phones, onboard an aircraft unless the operator of the aircraft has determined that operation of the PED will not cause interference with the navigation or communication system of the aircraft on which the device is to be used.³⁰ The FAA and a Federal Advisory Committee, RTCA,³¹ are currently studying the impact of PEDs on aircraft navigation and safety.³² In this connection, an RTCA subcommittee³³ has developed testing procedures to assess the risk of interference for particular PEDs onboard aircraft.³⁴ The subcommittee is also doing further investigation into the use of new technologies onboard aircraft. The development of testing procedures,

²⁹ See “Use of Portable Electronic Devices Aboard Aircraft,” Advisory Circular, AC No. 91.21-1A at ¶ 1 (Oct. 2, 2000) (Advisory Circular).

³⁰ 14 C.F.R. § 91.21. The rule in its entirety reads as follows:

(a) Except as provided in paragraph (b) of this section, no person may operate, nor may any operator or pilot in command of an aircraft allow the operation of, any portable electronic device on any of the following U.S.-registered civil aircraft:

(1) Aircraft operated by a holder of an air carrier operating certificate or an operating certificate; or

(2) Any other aircraft while it is operated under IFR.

(b) Paragraph (a) of this section does not apply to—

(1) Portable voice recorders;

(2) Hearing aids;

(3) Heart pacemakers;

(4) Electric shavers; or

(5) Any other portable electronic device that the operator of the aircraft has determined will not cause interference with the navigation or communication system of the aircraft on which it is to be used.

(c) In the case of an aircraft operated by a holder of an air carrier operating certificate or an operating certificate, the determination required by paragraph (b)(5) of this section shall be made by that operator of the aircraft on which the particular device is to be used. In the case of other aircraft, the determination may be made by the pilot in command or other operator of the aircraft.

³¹ RTCA, Inc. is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management (CNS/ATM) system issues. It is organized under the Federal Advisory Committee Act, and its recommendations are used by the FAA as the basis for policy, program, and regulatory decisions and by the private sector as the basis for development, investment, and other business decisions. See www.rtca.org.

³² In addition to the RTCA study, in November 2003, the Consumers Electronics Association (CEA) held a “Discovery Group” meeting to determine the level of inter-industry support for a standardization project to facilitate the managed use of wireless PEDs brought onboard aircraft and used by passengers during flight. In October 2004, the group released a “best practices” guide that details recommended industry practices that can be used to address (1) a consistent and easily identifiable transmitting/non-transmitting indicator(s) for PEDs; (2) the ease of turning off the transmitter in PEDs; and (3) associated terminology used to convey information about devices, device operation, and passenger use. See www.ce.org/about_cea/cea_initiatives/viewInitiativesOverview.asp?name=321.

³³ RTCA SC-202 – Portable Electronic Devices.

³⁴ See Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft, DO-294, SC-202 (dated Oct. 19, 2004).

and the collection of data are the RTCA's first steps in developing a recommendation that will be used by the FAA to evaluate whether particular PEDs, such as cellular handsets, negatively impact aircraft navigation and safety or whether the airborne use of cellular handsets and other PEDs is consistent with aviation safety.

III. DISCUSSION

10. We believe that allowing the use of wireless handsets during flight has the potential to benefit homeland security, business, and consumers by adding to future and existing air-ground communications options, including broadband applications. We thus believe that the removal or modification of the Commission's cellular airborne prohibition will benefit public safety and homeland security personnel in need of an air-to-ground communications link in case of an emergency situation. It should also provide enhanced flexibility for service providers to meet the increasing demand for access to mobile telephone and mobile data services and encourage the deployment of innovative and efficient communications technologies and applications.³⁵ Because of these potential benefits, we tentatively conclude that our current blanket prohibition on airborne cellular use should be modified, and we seek comment on ways to ensure that this can be accomplished without creating the potential for harmful interference to terrestrial cellular networks. We believe that taking action that will lead to more opportunities for service and less regulation for cellular licensees, yet which guards against harmful interference to terrestrial wireless communications, serves the public interest.

11. In the *Air-Ground Notice*, the Commission pointed out that the potential demand for using cellular telephones while airborne appears to be high.³⁶ Certain commercial airlines, for example, have expressed significant interest in regulatory reforms that would allow passengers to use their own wireless phones on flights.³⁷ Most of the commenters in the instant proceeding support the removal of Section 22.925's proscription against the airborne use of cellular telephones, as long as we ensure that there will be no harmful interference to terrestrial cellular networks.³⁸ Some commenters, however, oppose

³⁵ In addition, the Commission's Spectrum Policy Task Force Report points to increased flexibility in the use of spectrum as an important means of promoting greater technical, economic, and marketplace efficiency. See FCC Staff Report, *Spectrum Policy Task Force Report*, ET Dkt. No. 02-135 at 3 (rel. Nov. 2002).

³⁶ *Air-Ground Notice*, 18 FCC Rcd at 8389 ¶ 16.

³⁷ *Air-Ground Notice*, 18 FCC Rcd at 8389 ¶ 16. Indeed, it appears that there is significant interest, especially among the airlines and their customers, for individuals to be able to use their own mobile phones on aircraft. Verizon Airfone, for example, has indicated that in order to meet the needs of consumers on commercial aircraft, it "plans solutions that would use other frequencies, such as the 2.4 GHz band used by the unlicensed Bluetooth and 802.11b technologies that are already available in many portable devices and are expected to be integrated into some cellular handsets soon." See Letter to Marlene H. Dortch, Secretary, Federal Communications Commission, from L. Andrew Tollin, Douglas I. Brandon, J.R. Carbone, and John T. Scott, III, at 2 (dated Sept. 23, 2002). A Verizon Airfone representative explained that "[p]assengers would use their personal cell phones to connect to the onboard phone system through a Bluetooth access point, so that the onboard phone system would be the bearer system to the ground." See "Inflight Cell-Phone Tests Challenged," *WAEA Industry News* (Sept. 16, 2002) at 3.

³⁸ See AirCell Comments at 11 (Section 22.925 should be modified to permit airborne use so long as handsets are controlled in a manner that ensures against harmful interference to terrestrial networks); Boeing Reply Comments at 11-13 (Commission should develop a more comprehensive record to determine whether elimination of the ban is warranted); Motorola Comments at 3 (before the Commission eliminates the ban on the airborne use of cellular handsets, it should be certain that no interference to terrestrial cellular operations will occur); SITA Reply (continued....)

eliminating the rule based on concern that harmful interference will result from airborne use of “off the shelf” cellular handsets.³⁹

12. We believe, like the commenters, that freedom from harmful interference and the continued reliability of cellular systems are important. As the record in this proceeding demonstrates, even among those that support the elimination of the prohibition, there is unanimous concern that repeal or modification of the rule not result in harmful interference to terrestrial cellular networks.⁴⁰ Simply removing the cellular handset prohibition, therefore, would not be in the public interest. At the same time, if there are technological solutions that address the interference issue, we want to facilitate the ability of passengers and crew members aboard airborne aircraft to use their mobile handsets to make and receive calls. Thus, continuing to impose a blanket prohibition on airborne cellular use also would not be in the public interest. We are not prepared to take this step, however, without further development of the record on possible technical solutions. While some commenters assert that the technology exists that will allow cellular telephones to be used on aircraft without causing unwanted interference, no party has provided sufficient detail explaining how eliminating the ban would actually work. Accordingly, we believe that Section 22.925 of our rules should be replaced with a more flexible policy, and we seek comment on whether the proposals detailed below are appropriate substitutes for the current ban on airborne cellular use.

A. Use of Wireless Handsets Controlled by Onboard Pico Cells

13. The record in the Air-Ground proceeding suggests that providing for airborne operation of “off the shelf” cellular handsets on a limited basis may encourage the development of technologies and services that benefit homeland security, business, and consumers.⁴¹ Moreover, we believe such operation may further our goal of increasing flexibility for cellular licensees without creating interference to terrestrial operations. One promising technological approach that could support non-interfering airborne use of wireless handsets is to control handset operation through use of airborne “pico cells.” In effect, an airborne pico cell is a low power cellular base station installed in the aircraft for the purpose of communicating with (and controlling the operations of) cellular handsets or other cellular devices brought on the aircraft by passengers and crew. Thus, a pico cell is analogous to an in-building wireless system (like those used in large buildings, malls, etc.) for use in the aircraft. The cellular signal travels from the

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Comments at 2-4 (Commission could consider lifting the ban as long as air-traffic safety not jeopardized); Space Data Reply Comments at 8-11 (wireless handsets should be able to place calls through different types of networks in light of technological advancements).

³⁹ See Cingular Comments at 10; Qualcomm Comments at 10; Verizon Wireless Comments at 3. An opposition to changing the airborne cellular ban was also filed by Matt Edwards, who opposes permitting wireless phone use on airborne aircraft due to concerns about the effect of individuals carrying on loud conversations on their wireless phones on an enclosed plane as well as the potential exposure to increased levels of radiofrequency radiation. See Matt Edwards Comments at 1.

⁴⁰ See AirCell Comments at 11; Boeing Reply Comments at 11-13; Motorola Comments at 3; SITA Reply Comments at 2-4; Space Data Reply Comments at 8-11.

⁴¹ See, e.g. Letter from Dean R. Brenner, Senior Director, Government Affairs, Qualcomm Incorporated, to Marlene H. Dortch, Secretary, Federal Communications Commission, dated July 20, 2004 (*Qualcomm Ex Parte*). In this *ex parte* submission from the Air-Ground proceeding, Qualcomm outlines a proof of concept demonstration to show the safe use of mobile phones in an airplane cabin during flight. See also www.qualcomm.com/press/releases/2004/040715_aa_testflight.html.

cellular handset to the pico cell, which then relays the call to the ground via a separate air-to-ground link, e.g., via a satellite band or the 800 MHz Air-Ground band.⁴²

14. The pico cell concept has the potential to address concerns of interference from airborne handsets to terrestrial cellular base stations because the pico cell would not use the cellular band to provide the air-ground link between the pico cell and the public switched telephone network or the Internet.⁴³ Instead, airborne use of cellular frequencies would be limited to communication inside the aircraft between the cellular handset and the pico cell, while the air-ground link would be provided on a non-cellular band that would not threaten interference to terrestrial-based cellular networks. In addition, interference to terrestrial cellular stations would be prevented because the airborne pico cell would minimize handset power levels by instructing handsets to operate at their lowest power setting.⁴⁴ In contrast, without a ready pico cell on the aircraft, airborne handsets would normally operate at their highest power setting in an attempt to reach base stations located far away on the ground, potentially causing interference to terrestrial cellular networks.

15. The development of such a pico cell architecture in which pico cells communicate with, and control, consumer handsets using a particular digital format is well under way. For example, the successful use of multiple CDMA handsets onboard an airborne aircraft was demonstrated in the Qualcomm proof of concept demonstration conducted in July 2004.⁴⁵ Another example includes successfully completed in-flight tests by AIRINC Incorporated and Telenor, that allowed the use of standard GSM handsets linked to an onboard pico cell.⁴⁶ Development of an architecture in which the pico cell controls handsets using any of a variety of air interfaces (e.g., GSM, CDMA, TDMA) appears to present a greater challenge. We seek comment on whether we would need to mandate that the pico cell cover a specific set of technologies so that all handsets on board aircraft are controlled by the pico cell.

16. The ability of pico cells to minimize handset power levels thus may enable us to remove or relax Section 22.925. Accordingly, we propose to permit cellular handsets to be used in airborne aircraft so long as they are operating under control of a pico cell (installed in accordance with FAA rules) that will instruct the handsets to operate at a sufficiently low power setting so as to not interfere with airborne or terrestrial systems.⁴⁷ We ask commenters whether we should adopt technical rules regarding the

⁴² See, e.g., *Qualcomm Ex Parte*. See also "In-flight Cell Phones 'Worked Great' in Test," Dan Reed, USA Today, (July 2004). In this test, a Globalstar satellite link was used to connect the pico cell to the public telephone network.

⁴³ Pico cells could also address potential interference to aviation systems from devices under control of that pico cell.

⁴⁴ See Letter from Dean R. Brenner, Senior Director, Government Affairs, Qualcomm Incorporated, to Marlene H. Dortch, Secretary, Federal Communications Commission, dated Sept. 30, 2004. In this *ex parte* submission, Qualcomm presents a written overview of its proof of concept demonstration.

⁴⁵ See *Qualcomm Ex Parte*; See also "In-flight Cell Phones 'Worked Great' in Test," Dan Reed, USA Today, (July 2004).

⁴⁶ See www.arinc.com/news/2004/09-16-04.html.

⁴⁷ Commenters should be aware that because many aircraft are operated by FAA air carrier certificate holders, FAA certification would be required before a pico cell could be installed on such aircraft.

onboard operation of pico cells using 800 MHz cellular spectrum. For example, if an airborne pico cell were to fail, how should our regulations address the risk of airborne cell phones beginning to search for a terrestrial base station and transmitting at maximum power? We seek comment generally on the viability of this and other potential technological advancements, and we solicit any other ideas or suggestions that commenters believe would increase flexibility for cellular licensees, while avoiding interference to airborne and terrestrial systems. Although we are mainly concerned with potential interference to terrestrial systems, we also recognize the aviation safety concerns that form the basis of the FAA's prohibition on mobile phone use.⁴⁸ Consequently, we ask commenters to address whether we should adjust the Commission's permissible out-of-band and spurious emission limits on cellular handsets in order to ensure that aircraft systems are not affected by unwanted emission from cell phones.⁴⁹

17. We also ask that commenters address the issue of who should have rights to operate on 800 MHz cellular spectrum in an airborne pico cell environment. As a threshold matter, we propose that cellular licensees should have the right to operate pico cell systems on their licensed frequencies. Because, however, such pico cell operations would be airborne and transitory, rather than permanently located in any particular licensee's terrestrial service area, and in principle would access a wide range of cellular frequencies, we seek comment on how these rights should be apportioned or shared among such licensees. We also seek comment as to how interference protection would be provided to terrestrial operations. As one example of how this might work, any 800 MHz cellular licensee, regardless of the location of their service area and the flight path of the aircraft, would be authorized to install a pico cell that operates on these frequencies within the aircraft. Under this approach, the cellular licensee would be responsible for the proper operation of the pico cell and would be in a position to remedy any interference to ground systems. Similarly, a group of licensees might operate the pico cell.

18. We also seek comment on whether any parties besides, or in addition to, cellular licensees should have rights to airborne use of this spectrum—either under a secondary market arrangement (*e.g.*, a spectrum lease)—or under a separate authorization. For example, should the owner of a particular aircraft be able to install and operate a pico cell without leasing spectrum usage rights or partnering with a cellular carrier? Should a third party, other than the aircraft operator, be authorized to install and operate the pico cell? If we adopted a third party approach, what should the parameters or extent of such third party rights be, and what interference protection obligations would such third parties have to terrestrial cellular licensees? Should such rights be granted solely on a secondary basis to that of terrestrial cellular systems in order to ensure that terrestrial cellular systems are protected from interference?

19. We also ask that commenters address whether pico cells should be individually licensed or subject to some form of "blanket" license or individual registration. Under any of these pico cell scenarios, we stress that protecting terrestrial cellular systems from harmful interference remains a paramount concern. We also believe that to ensure that terrestrial cellular systems can obtain prompt

⁴⁸ For example, should the pico cell fail, a sudden surge of power emitted from the aggregate of cell phones in use could result in interference with the aircraft's navigation or communications systems. We will continue to coordinate with the FAA to ensure that our policies and rules complement the FAA's separate evaluation of whether the airborne use of PEDs is consistent with aviation navigation and safety.

⁴⁹ The RTCA is continuing to study the emission limits for personal electronic devices operating onboard aircraft that would prevent interference to aircraft avionics. See *Guidance on Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft*, DO-294, SC-202 (dated Oct. 19, 2004). We will consider any recommended changes to Commission rules if and when such recommendations are made.

relief in the event of harmful interference from airborne operations, our rules should provide for clear identification of the particular entity or entities responsible for airborne pico cell operations, as well as for complying with other Commission rules and policies relating to airborne use of cellular frequencies.

20. In addition, we seek comment on whether the pico cell proposal outlined above should apply to Part 90 operations, or some subset of Part 90 consumer equipment (such as consumer handsets operated by SMR licensees). As noted above, there is a separate airborne limitation for Part 90 land mobile (including SMR) handsets that impacts operation of many consumer devices such as those operated by Nextel.⁵⁰ Although the current Part 90 technical and operational limitations are more permissive than the current 800 MHz cellular ban, our proposal would represent additional flexibility for airborne Part 90 operation.

21. Similarly, we seek comment whether, and the extent to which, our pico cell proposal should apply to Part 24 and Part 27 services. In this connection, we note that many telephones today are dual band phones, capable of operating in both cellular and PCS frequencies. We ask that commenters address whether this should affect our decision here. Although there is currently no Commission limitation on operation of Part 24 PCS or Part 27 WCS devices in airborne aircraft, they are subject to FAA restrictions on PEDs, and as a result, the airborne use of Part 24 and Part 27 devices, as well as the effect of such use on terrestrial systems, have generally not been at issue. We seek comment, however, on whether it would be beneficial to adopt rules for pico cell operations in Part 24 and Part 27 bands in the event that the FAA modifies its policies. Keeping in mind our goals of increased flexibility and interference-free operations, would adopting such rules unnecessarily reduce the flexibility afforded to licensees in these bands, or would it provide a useful framework for the development of airborne applications in these bands to the extent technical and business considerations dictate?

B. Other Airborne Uses of 800 MHz Cellular Spectrum

22. We also seek comment on ways that the 800 MHz cellular spectrum might be used as a communications pipe between airborne aircraft and the ground. As mentioned earlier, we share the commenters' unanimous concern that terrestrial cellular operations not be subject to harmful interference. We believe, however, that it is possible to achieve the goal of increasing flexibility for cellular licensees without exposing terrestrial-based cellular networks to harmful interference. In this connection, we note that cellular infrastructure has changed greatly since 1991 when the airborne cellular use ban was first adopted and that promising technical innovations have occurred in the areas of power control, filter design, and antenna design that may assist the industry in resolving potential interference without a Commission-mandated ban on airborne use. Therefore, we seek comment on the possibility of relying on a long-term, industry-initiated solution to govern airborne use.

23. More particularly, we seek comment on whether the prohibition on airborne cellular use could be replaced by an industry-developed standard that would allow 800 MHz cellular licensees to offer airborne cellular service in accordance with a set of technical and operational limitations widely agreed to by the affected licensees. We believe that licensees have a strong incentive to develop such standards because of the flexibility in deployment and service offerings that airborne services could bring. We also note that organizations such as the Telecommunications Industry Association and the Electronic Industries Alliance have led, and continue to lead, successful efforts to develop technical and operational standards for introduction of new and additional technologies and services into already occupied spectrum

⁵⁰ See para. 8, *supra*.

by industry consensus, as opposed to government mandate.⁵¹ Should such consensus be reached with respect to airborne cellular operations, we would independently evaluate the standard and modify our rules and policies regarding airborne cellular use accordingly. Commenters should discuss the difficulties, as well as any solutions, to this approach. Commenters should also offer any other suggestions as to how the industry, rather than the Commission, can develop a regime that enables interference-free airborne cellular use.

24. In addition to the foregoing, we request comment on whether we should allow any cellular licensee to provide cellular service to airborne units on a secondary basis, subject to a set of conservative technical limitations. Based on our experience with AirCell, we believe that the potential for harmful interference to terrestrial networks can be successfully managed by a combination of technical limitations, including low power operation, use of directional or “smart” antennas, and diversity in antenna polarization. In this connection, based on the Texas tests conducted in 1997 involving AirCell licensees and the Commission, and many subsequent studies of air-to-ground path loss, we believe the record demonstrates that airborne transmissions at or below 0 dBm (1 milliWatt) power to the airborne antenna input are generally undetectable by ordinary cellular terrestrial base stations under all circumstances.⁵² We thus believe that the cellular service proposed here should be subject to specific, conservative technical criteria so that the transmitter power at the input to the airborne antenna is limited to 0 dBm (1 milliWatt). Although such a conservative power limit is sure to prevent harmful interference to terrestrial base stations, it may not be sufficient to facilitate real-world air-to-ground communications. Therefore, we propose that if directional or smart antennas, or diversity in antenna polarization is used, the 0 dBm limit may be increased by the amount of isolation provided by such methods.

25. We seek comment on how to quantify the effect of different types of isolation. For example, if cross-polarization isolation is employed, how much greater than 0 dBm should be allowed? Are there quantifiable factors already being employed in the industry? Or, do commenters believe that any isolation factor should be determined on a case-by-case basis? If so, commenters are requested to suggest any guiding principles that would aid our analysis and expedite consideration and agreement upon such isolation factors. In seeking to optimize the secondary use contemplated under this proposal, we also ask that commenters address whether we should limit the amount of cellular spectrum that may be used for secondary air-to-ground operations, as well as whether the number of secondary users should be limited. Moreover, we ask whether we should adopt any other restrictions or conditions, like, for example, the conditions that were imposed on AirCell.⁵³ We note that this proposal is currently limited to 800 MHz cellular spectrum because the record in this proceeding has focused on the 800 MHz band. If commenters believe that it is appropriate to include other spectrum bands and services, they should provide technical data in support.

26. We believe that this approach may increase the opportunities for carriers to offer, and the

⁵¹ For example, the TIA and the EIA have previously led the way in developing IS-95 CDMA, IS-136 TDMA, and GSM, and the Commission has previously incorporated such standards into its rules.

⁵² See, e.g., Final Report, AirCell Flight Test, July 10-11, 1997, Prepared by TEC Cellular, Inc. Two days of operational tests were conducted jointly by AirCell and several carriers in July 1997 at sites in Texas and Oklahoma to assess how the AirCell system would perform in a real-world environment.

⁵³ AirCell, Inc.; Petition, Pursuant to Section 7 of the Act, For a Waiver of the Airborne Cellular Rule, Or, in the Alternative, For a Declaratory Ruling, *Memorandum Opinion and Order*, 15 FCC Rcd 9622, 9650, Appendix (2000).

general public to receive, airborne cellular services and thereby result in concomitant benefits for both licensees and consumers. We seek comment on this proposal and ask whether there are any other technical or operational rules that we might adopt that will further the goal of enabling airborne cellular service on a secondary basis, as described here, that will not cause harmful interference to cellular terrestrial stations and/or users.

IV. PROCEDURAL MATTERS

A. Comment Filing Procedures

27. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. See Electronic Filing of Documents in Rulemaking Proceedings, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://www.fcc.gov/cgb/ecfs/> or the Federal eRulemaking Portal: <http://www.regulations.gov>. Filers should follow the instructions provided on the website for submitting comments.
 - For ECFS filers, if multiple docket or rulemaking numbers appear in the caption of this proceeding, filers must transmit one electronic copy of the comments for each docket or rulemaking number referenced in the caption. In completing the transmittal screen, filers should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions, filers should send an e-mail to ecfs@fcc.gov, and include the following words in the body of the message, "get form." A sample form and directions will be sent in response.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- The Commission's contractor will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, NE., Suite 110, Washington, DC 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail should be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: Contact the FCC to request materials in accessible formats (braille, large print, electronic files, audio format, etc.) by e-mail at FCC504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0531 (voice), 202-418-7365 (TTY).

B. Ex Parte Rules -- Permit-But-Disclose

28. This is a permit-but-disclose notice and comment rulemaking proceeding. Ex parte presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed pursuant to the Commission's rules.⁵⁴

C. Initial Regulatory Flexibility Analysis

29. As required by the Regulatory Flexibility Act,⁵⁵ the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities of the proposals addressed in this *Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix B. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines for comments on the *Notice*, and they should have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this *Notice*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration, in accordance with the Regulatory Flexibility Act.⁵⁶

D. Paperwork Reduction Act of 1995

30. This document does not contain proposed information collection(s) subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, it does not contain any new or modified "information collection burden for small business concerns with fewer than 25 employees," pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4).

E. Contact Information

31. The primary Wireless Telecommunications Bureau contact for this proceeding is Guy Benson at 202-418-2946, or e-mail at Guy.Benson@fcc.gov. Press inquiries should be directed to Lauren Patrich, Wireless Telecommunications Bureau, at (202) 418-7944, TTY at (202) 418-7233, or e-mail at Lauren.Patrich@fcc.gov.

⁵⁴ *See generally* 47 C.F.R. §§ 1.1202, 1.1203, 1.1206.

⁵⁵ *See* 5 U.S.C. § 603.

⁵⁶ *See* 5 U.S.C. § 603(a).

V. ORDERING CLAUSES

32. Accordingly, IT IS ORDERED THAT, pursuant to the authority contained in sections 1, 4(i), 11, and 303(r) and (y), 308, 309, and 332 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 161, 303(r), (y), 308, 309, and 332, this NOTICE OF PROPOSED RULEMAKING is hereby ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A**Proposed Rules****Part 22 of Title 47 of the Code of Federal Regulations is amended as follows:**

1. The authority citation for Part 22 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 222, 303, 309, and 332.

2. Section 22.925 is revised to read as follows:

§ 22.925 Prohibition on airborne operation of cellular telephones

(a) Cellular devices installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated and must be turned off while such aircraft are airborne (not touching the ground) unless as specified in paragraph (b) of this section. Unless measures are implemented aboard aircraft in accordance with paragraph (b), the following notice must be posted on or near each cellular device installed in any aircraft:

“The use of cellular telephones while this aircraft is airborne is prohibited by FCC rules, and the violation of this rule could result in suspension of service and/or a fine. The use of cellular telephones on this aircraft is also subject to FAA regulations.”

(b) Devices using 800 MHz cellular frequencies may be operated on airborne aircraft only if such devices are operated in a manner that will not cause interference to terrestrial cellular systems. Airborne operation of cellular devices is permissible only if operation of these devices is under the control of onboard equipment specifically designed to mitigate such interference.

Note: The FAA independently prohibits the use of personal electronic devices, including cellular devices, unless an aircraft operator has determined that use of those devices does not cause interference to an aircraft’s aviation navigation and communications systems.

APPENDIX B

INITIAL REGULATORY FLEXIBILITY ANALYSIS

33. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),⁵⁷ the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this *Notice of Proposed Rulemaking (Notice)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Notice* provided in paragraph 27 of the item. The Commission will send a copy of the *Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).⁵⁸ In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register.⁵⁹

A. Need for, and Objectives of, the Proposed Rules.

34. In this *Notice*, we propose to replace or relax the ban on airborne usage of 800 MHz cellular handsets as well as propose other steps to facilitate the use of wireless handsets and devices, including those used for broadband applications, on airborne aircraft in appropriate circumstances. Section 22.925 of the Commission's rules currently prohibits the airborne use of 800 MHz cellular telephones, including the use of such phones on commercial and private aircraft. We believe that allowing controlled use of cellular handsets and other wireless devices in airborne aircraft will promote homeland security and will benefit consumers by adding to future and existing air-ground communications options that will provide greater access for mobile voice and broadband services during flight.

35. In particular, this *Notice* proposes to permit the airborne operation of standard, "off the shelf" wireless handsets so long as the handsets are operating at their lowest power setting under control of a "pico cell" located on the aircraft. It also seeks comment on ways that the 800 MHz cellular spectrum could be used to provide a communications "pipe" between airborne aircraft and the ground. In this connection, we seek comment on whether the prohibition on airborne cellular use could be replaced by an industry-developed standard that would guard against harmful interference to airborne and terrestrial systems through appropriate technical and operational limitations. Finally, this *Notice* seeks comment on whether to amend our rules to allow cellular licensees to provide service on a secondary basis to airborne units subject to technical limitations aimed at preventing harmful interference to airborne and terrestrial cellular systems.

B. Legal Basis.

36. This action is taken under Sections 1, 4(i), 11, and 303(r) and (y), 308, 309, and 332 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 161, 303(r), (y), 308, 309, and 332.

⁵⁷ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. §§ 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

⁵⁸ See 5 U.S.C. § 603(a).

⁵⁹ See 5 U.S.C. § 603(a).

C. Description and Estimate of the Number of Small Entities to which the Rules Will Apply.

37. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.⁶⁰ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁶¹ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.⁶² A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).⁶³

38. In this section, we further describe and estimate the number of small entity licensees and regulatees that may be affected by our action. The most reliable source of information regarding the total numbers of certain common carrier and related providers nationwide, as well as the number of commercial wireless entities, appears to be the data that the Commission publishes in its *Trends in Telephone Service* report.⁶⁴ The SBA has developed small business size standards for wireline and wireless small businesses within the three commercial census categories of Wired Telecommunications Carriers,⁶⁵ Paging,⁶⁶ and Cellular and Other Wireless Telecommunications.⁶⁷ Under these categories, a business is small if it has 1,500 or fewer employees. Below, using the above size standards and others, we discuss the total estimated numbers of small businesses that might be affected by our actions.

39. Cellular Licensees. The SBA has developed a small business size standard for wireless firms within the broad economic census category “Cellular and Other Wireless Telecommunications.”⁶⁸ Under this SBA category, a wireless business is small if it has 1,500 or fewer employees. For the census category Cellular and Other Wireless Telecommunications firms, Census Bureau data for 1997 show that

⁶⁰ 5 U.S.C. § 604(a)(3).

⁶¹ 5 U.S.C. § 601(6).

⁶² 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

⁶³ 15 U.S.C. § 632.

⁶⁴ FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, *Trends in Telephone Service* at Table 5.3, Page 5-5 (May 2004) (*Trends in Telephone Service*). This source uses data that are current as of October 22, 2003.

⁶⁵ 13 C.F.R. § 121.201, North American Industry Classification System (NAICS) code 513310 (changed to 517110 in Oct. 2002).

⁶⁶ 13 C.F.R. § 121.201, NAICS code 513321 (changed to 517211 in Oct. 2002).

⁶⁷ 13 C.F.R. § 121.201, NAICS code 513322 (changed to 517212 in Oct. 2002).

⁶⁸ 13 C.F.R. § 121.201, NAICS code 513322 (changed to 517212 in October 2002).

there were 977 firms in this category, total, that operated for the entire year.⁶⁹ Of this total, 965 firms had employment of 999 or fewer employees, and an additional 12 firms had employment of 1,000 employees or more.⁷⁰ Thus, under this category and size standard, the great majority of firms can be considered small. According to the most recent Trends in Telephone Service data, 719 carriers reported that they were engaged in the provision of cellular service, personal communications service, or specialized mobile radio telephony services, which are placed together in the data.⁷¹ We have estimated that 294 of these are small, under the SBA small business size standard.⁷²

40. Lower 700 MHz Band Licenses. We adopted criteria for defining three groups of small businesses for purposes of determining their eligibility for special provisions such as bidding credits.⁷³ We have defined a small business as an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the preceding three years.⁷⁴ A very small business is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$15 million for the preceding three years.⁷⁵ Additionally, the lower 700 MHz Service has a third category of small business status that may be claimed for Metropolitan/Rural Service Area (MSA/RSA) licenses. The third category is entrepreneur, which is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$3 million for the preceding three years.⁷⁶ The SBA has approved these small size standards.⁷⁷ An auction of 740 licenses (one license in each of the 734 MSAs/RSAs and one license in each of the six EAGs) commenced on August 27, 2002, and closed on September 18, 2002. Of the 740 licenses available for auction, 484 licenses were sold to 102 winning bidders. Seventy-two of the winning bidders claimed small business, very small business or entrepreneur status and won a total of 329 licenses.⁷⁸ A second

⁶⁹ U.S. Census Bureau, 1997 Economic Census, Subject Series: "Information," Table 5, Employment Size of Firms Subject to Federal Income Tax: 1997, NAICS code 513322 (issued October 2000).

⁷⁰ U.S. Census Bureau, 1997 Economic Census, Subject Series: "Information," Table 5, Employment Size of Firms Subject to Federal Income Tax: 1997, NAICS code 513322 (issued October 2000). The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is "Firms with 1000 employees or more."

⁷¹ FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, "Trends in Telephone Service" at Table 5.3, page 5-5 (August 2003). This source uses data that are current as of December 31, 2001.

⁷² FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, "Trends in Telephone Service" at Table 5.3, page 5-5 (August 2003). This source uses data that are current as of December 31, 2001.

⁷³ See Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), *Report and Order*, 17 FCC Rcd 1022 (2002).

⁷⁴ *Id.* at 1087-88 ¶ 172.

⁷⁵ *Id.*

⁷⁶ *Id.* at 1088 ¶ 173.

⁷⁷ See Letter to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated August 10, 1999.

⁷⁸ See "Lower 700 MHz Band Auction Closes," *Public Notice*, 17 FCC Rcd 17272 (WTB 2002).

auction commenced on May 28, 2003, and closed on June 13, 2003, and included 256 licenses: 5 EAG licenses and 476 CMA licenses.⁷⁹ Seventeen winning bidders claimed small or very small business status and won sixty licenses, and nine winning bidders claimed entrepreneur status and won 154 licenses.⁸⁰

41. **Upper 700 MHz Band Licenses.** The Commission released a *Report and Order* authorizing service in the upper 700 MHz band.⁸¹ This auction, previously scheduled for January 13, 2003, has been postponed.⁸²

42. **Broadband Personal Communications Service (PCS).** The broadband PCS spectrum is divided into six frequency blocks designated A through F, and the Commission has held auctions for each block. The Commission defined “small entity” for Blocks C and F as an entity that has average gross revenues of \$40 million or less in the three previous calendar years.⁸³ For Block F, an additional classification for “very small business” was added and is defined as an entity that, together with its affiliates, has average gross revenues of not more than \$15 million for the preceding three calendar years.⁸⁴ These standards defining “small entity” in the context of broadband PCS auctions have been approved by the SBA.⁸⁵ No small businesses, within the SBA-approved small business size standards bid successfully for licenses in Blocks A and B. There were 90 winning bidders that qualified as small entities in the Block C auctions. A total of 93 small and very small business bidders won approximately 40 percent of the 1,479 licenses for Blocks D, E, and F.⁸⁶ On March 23, 1999, the Commission re-auctioned 347 C, D, E, and F Block licenses. There were 48 small business winning bidders. On January 26, 2001, the Commission completed the auction of 422 C and F Broadband PCS licenses in Auction No. 35. Of the 35 winning bidders in this auction, 29 qualified as “small” or “very small” businesses. Subsequent events, concerning Auction 305, including judicial and agency determinations, resulted in a total of 163 C and F Block licenses being available for grant. In addition, we note that, as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not

⁷⁹ See “Lower 700 MHz Band Auction Closes,” *Public Notice*, 18 FCC Rcd 11873 (WTB 2003).

⁸⁰ *Id.*

⁸¹ Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission’s Rules, *Second Memorandum Opinion and Order*, 16 FCC Rcd 1239 (2001).

⁸² See “Auction of Licenses for 747-762 and 777-792 MHz Bands (Auction No. 31) Is Rescheduled,” *Public Notice*, 16 FCC Rcd 13079 (WTB 2003).

⁸³ See *Amendment of Parts 20 and 24 of the Commission’s Rules – Broadband PCS Competitive Bidding and the Commercial Mobile Radio Service Spectrum Cap*, WT Docket No. 96-59, Report and Order, 11 FCC Rcd 7824 (1996); see also 47 C.F.R. § 24.720(b).

⁸⁴ See *Amendment of Parts 20 and 24 of the Commission’s Rules – Broadband PCS Competitive Bidding and the Commercial Mobile Radio Service Spectrum Cap*, WT Docket No. 96-59, Report and Order, 11 FCC Rcd 7824 (1996).

⁸⁵ See, e.g., *Implementation of Section 309(j) of the Communications Act – Competitive Bidding*, PP Docket No. 93-253, Fifth Report and Order, 9 FCC Rcd 5332 (1994).

⁸⁶ Broadband PCS, D, E and F Block Auction Closes, (rel. Jan. 14, 1997); see also *Amendment of the Commission’s Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licenses*, WT Docket No. 97-82, Second Report and Order, 12 FCC Rcd 16436 (1997).

necessarily represent the number of small businesses currently in service. In addition, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated.

43. **Narrowband PCS.** The Commission held an auction for Narrowband PCS licenses that commenced on July 25, 1994, and closed on July 29, 1994. A second commenced on October 26, 1994 and closed on November 8, 1994. For purposes of the first two Narrowband PCS auctions, “small businesses” were entities with average gross revenues for the prior three calendar years of \$40 million or less.⁸⁷ Through these auctions, the Commission awarded a total of 41 licenses, 11 of which were obtained by four small businesses.⁸⁸ To ensure meaningful participation by small business entities in future auctions, the Commission adopted a two-tiered small business size standard in the *Narrowband PCS Second Report and Order*.⁸⁹ A “small business” is an entity that, together with affiliates and controlling interests, has average gross revenues for the three preceding years of not more than \$40 million.⁹⁰ A “very small business” is an entity that, together with affiliates and controlling interests, has average gross revenues for the three preceding years of not more than \$15 million.⁹¹ The SBA has approved these small business size standards.⁹² A third auction commenced on October 3, 2001 and closed on October 16, 2001. Here, five bidders won 317 (MTA and nationwide) licenses.⁹³ Three of these claimed status as a small or very small entity and won 311 licenses. A fourth auction commenced on September 24, 2003 and closed on September 29, 2003. Here, four bidders won 48 licenses. Four of these claimed status as a very small entity and won 48 licenses.⁹⁴ Finally, a fifth auction commenced on September 24, 2003 and closed on September 25, 2003. Here, one bidder won five licenses.⁹⁵ That bidder claimed status as a very small entity.

⁸⁷ Implementation of Section 309(j) of the Communications Act – Competitive Bidding Narrowband PCS, *Third Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 10 FCC Rcd 175, 196 ¶ 46 (1994).

⁸⁸ See “Announcing the High Bidders in the Auction of ten Nationwide Narrowband PCS Licenses, Winning Bids Total \$617,006,674,” *Public Notice*, PNWL 94-004 (rel. Aug. 2, 1994); “Announcing the High Bidders in the Auction of 30 Regional Narrowband PCS Licenses; Winning Bids Total \$490,901,787,” *Public Notice*, PNWL 94-27 (rel. Nov. 9, 1994).

⁸⁹ Amendment of the Commission’s Rules to Establish New Personal Communications Services, Narrowband PCS, *Second Report and Order and Second Further Notice of Proposed Rule Making*, 15 FCC Rcd 10456, 10476 ¶ 40 (2000).

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² See Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission from Aida Alvarez, Administrator, Small Business Administration, dated December 2, 1998.

⁹³ See “Narrowband PCS Auction Closes,” *Public Notice*, 16 FCC Rcd 18663 (WTB 2001).

⁹⁴ See “Narrowband PCS Spectrum Auction Closes,” *Public Notice*, 18 FCC Rcd 19751 (WTB 2003).

⁹⁵ See “Regional Narrowband PCS Spectrum Auction Closes,” *Public Notice*, 18 FCC Rcd 19689 (WTB 2003).

44. **Specialized Mobile Radio (SMR).** The Commission awards “small entity” bidding credits in auctions for SMR geographic area licenses in the 800 MHz and 900 MHz bands to firms that had revenues of no more than \$15 million in each of the three previous calendar years.⁹⁶ The Commission awards “very small entity” bidding credits to firms that had revenues of no more than \$3 million in each of the three previous calendar years.⁹⁷ The SBA has approved these small business size standards for the 900 MHz Service.⁹⁸ The Commission has held auctions for geographic area licenses in the 800 MHz and 900 MHz bands. The 900 MHz SMR auction began on December 5, 1995, and closed on April 15, 1996. Sixty bidders claiming that they qualified as small businesses under the \$15 million size standard won 263 geographic area licenses in the 900 MHz SMR band. The 800 MHz SMR auction for the upper 200 channels began on October 28, 1997, and was completed on December 8, 1997. Ten bidders claiming that they qualified as small businesses under the \$15 million size standard won 38 geographic area licenses for the upper 200 channels in the 800 MHz SMR band.⁹⁹ A second auction for the 800 MHz band was held on January 10, 2002 and closed on January 17, 2002 and included 23 BEA licenses. One bidder claiming small business status won five licenses.¹⁰⁰

45. The auction of the 1,050 800 MHz SMR geographic area licenses for the General Category channels began on August 16, 2000, and was completed on September 1, 2000. Eleven bidders won 108 geographic area licenses for the General Category channels in the 800 MHz SMR band qualified as small businesses under the \$15 million size standard. In an auction completed on December 5, 2000, a total of 2,800 Economic Area licenses in the lower 80 channels of the 800 MHz SMR service were sold. Of the 22 winning bidders, 19 claimed “small business” status and won 129 licenses. Thus, combining all three auctions, 40 winning bidders for geographic licenses in the 800 MHz SMR band claimed status as small business.

46. In addition, there are numerous incumbent site-by-site SMR licensees and licensees with extended implementation authorizations in the 800 and 900 MHz bands. We do not know how many firms provide 800 MHz or 900 MHz geographic area SMR pursuant to extended implementation authorizations, nor how many of these providers have annual revenues of no more than \$15 million. One firm has over \$15 million in revenues. We assume, for purposes of this analysis, that all of the remaining existing extended implementation authorizations are held by small entities, as that small business size standard is established by the SBA.

47. **Wireless Communications Services.** This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses. The Commission defined “small business” for

⁹⁶ 47 C.F.R. § 90.814(b)(1).

⁹⁷ *Id.*

⁹⁸ See Letter to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated August 10, 1999. We note that, although a request was also sent to the SBA requesting approval for the small business size standard for 800 MHz, approval is still pending.

⁹⁹ See “Correction to Public Notice DA 96-586 ‘FCC Announces Winning Bidders in the Auction of 1020 Licenses to Provide 900 MHz SMR in Major Trading Areas,’” *Public Notice*, 18 FCC Rcd 18367 (WTB 1996).

¹⁰⁰ See “Multi-Radio Service Auction Closes,” *Public Notice*, 17 FCC Rcd 1446 (WTB 2002).

the wireless communications services (WCS) auction as an entity with average gross revenues of \$40 million for each of the three preceding years, and a “very small business” as an entity with average gross revenues of \$15 million for each of the three preceding years.¹⁰¹ The SBA has approved these definitions.¹⁰² The FCC auctioned geographic area licenses in the WCS service. In the auction, which commenced on April 15, 1997 and closed on April 25, 1997, there were seven bidders that won 31 licenses that qualified as very small business entities, and one bidder that won one license that qualified as a small business entity. An auction for one license in the 1670-1674 MHz band commenced on April 30, 2003 and closed the same day. One license was awarded. The winning bidder was not a small entity.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements.

48. The *Notice* does not propose any reporting, recordkeeping or compliance requirements. However, we seek comment on what, if any, requirements may arise as a result of our discussion in the *Notice*.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

49. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in developing its approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.¹⁰³

50. Regarding our proposal to allow pico cells to control 800 MHz cellular telephones while airborne, *see* paras. 13-16, *supra*, we anticipate no adverse impact on small businesses. Currently, cellular telephone use is prohibited by Section 22.925 of our rules. Relaxing or removing this restriction will generally result in increased opportunities for all sorts of businesses, including small businesses.

51. More specifically, we propose to grant cellular licensees authority to operate pico cell systems on their licensed frequencies, *see* para. 17, *supra*. In the event that we ultimately determine that eligibility should be limited solely to cellular licensees, we recognize that other entities, including small business entities, would not be able to take advantage of the increased market opportunities for air-to-ground voice service. Cellular small business licensees, however, would benefit from increased flexibility and increased ability to offer services. As an alternative approach, we seek comment in this *Notice* as to whether the rights to operate such systems should be available to other (non-cellular) entities. Should we determine that the public interest would be served by opening up eligibility, small businesses

¹⁰¹ Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (WCS), *Report and Order*, 12 FCC Rcd 10785, 10879 ¶ 194 (1997).

¹⁰² *See* Letter to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission, from Aida Alvarez, Administrator, Small Business Administration, dated December 2, 1998.

¹⁰³ 5 U.S.C. § 603 (c)(1)-(4).

that are not cellular licensees could benefit from increased market opportunities.

52. Similarly, we seek comment on whether our pico cell proposal should apply to non-cellular operations under Parts 24 (PCS), 27 (WCS), and 90 (SMR and other land mobile radio) of our rules. Regarding licensees regulated under Parts 24 and 27, there is currently no Commission rule restricting airborne use of wireless handsets. Consequently, on one hand, if we were to include these services in our proposal, it could be construed that the flexibility of all licensees, including small businesses, would be reduced. On the other hand, mobile units covered under these licenses are currently prohibited by the FAA to be used in aircraft while airborne. We also note that such devices may not be able to connect with ground stations above certain altitudes due to the great distances. Accordingly, to the extent that this proceeding leads to the permissible and viable airborne operation of wireless devices using Part 24 and Part 27 spectrum, we believe all entities could benefit. Regarding land mobile licensees under Part 90, our rules limit the airborne use of mobile units. Our proposal to relax these limitations will, therefore, result in increased opportunities for both large and small businesses.

53. We also seek comment on the practicality of an industry-initiated agreement, *see* para. 23, *supra*, that sets forth technical and operational standards that would allow cellular carriers to provide air-to-ground services while ensuring no harmful interference to terrestrial cellular systems. We believe that no adverse impact on small entities would result from such an industry consensus. To the contrary, small businesses will be able to participate in the industry-initiated process and take advantage of increased opportunities to offer service to aircraft.

54. Finally, regarding our decision to seek comment on whether cellular licensees should be able to offer service to airborne wireless units on a secondary basis, subject to conservative technical and operational rules, *see* para. 24, *supra*, we anticipate no adverse impact on small entities. In fact, were we to ultimately adopt rules contemplated by this policy, small businesses would benefit from increased opportunities and flexibility to serve their clients.

F. Federal Rules that May Duplicate, Overlap or Conflict with the Proposed Rules.

55. 14 C.F.R. §§ 91.21, 121.306, 125.204, and 135.144.

**STATEMENT OF
CHAIRMAN MICHAEL K. POWELL**

Re: Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and other Wireless Devices Aboard Airborne Aircraft, WT Docket No. 04-435, Notice of Proposed Rulemaking

Today we live in an increasingly mobile world and Americans are demanding greater access to wireless services and applications. This Notice of Proposed Rule Making (NPRM) is an important step in achieving the Commission's goal of fostering the development of technologies that will increase America's communications options—in this particular case, communications between wireless handsets airborne and on the ground—while ensuring that terrestrial systems are not subject to harmful interference. Our actions today begin a process that I expect will benefit the traveling public as well as public safety personnel, by increasing the communications options for those aboard airborne aircraft. Although operation of wireless devices aboard aircraft remains subject to Federal Aviation Administration (FAA) rules and policies that restrict their use to ensure against interference to onboard communications and navigation equipment, the adoption of this NPRM will help ensure that the Commission's rules do not unnecessarily restrict the availability of airborne wireless services should the FAA and aircraft operators permit the use of airborne wireless devices.

**STATEMENT OF
COMMISSIONER MICHAEL J. COPPS**

RE: Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and other Wireless Devices Aboard Airborne Aircraft (NPRM).

We consider the airborne cellular NPRM today. In it we ask for comment on whether we should relax the rules that prohibit using mobile phones on airplanes. There is good and bad in this NPRM. On one hand, I am glad that we are exploring whether technology has evolved so that the technical limitations that led us to establish this interference rule are no longer necessary. On the other side of the scale, many airline passengers don't relish the idea of sitting next to someone yelling into their cell phones for an entire six hour flight. I know I don't! So I hope that consumers as well as companies will participate fully in this NPRM and let us know what they think. Meanwhile, we here at the Commission need to determine precisely what jurisdiction the FCC has over the annoying-seatmate issue. If we are limited to an exploration of the interference environment, we must ensure that some authority, maybe the airline, is empowered to control the problem.

Thanks to WTB and OET for their hard and good work.