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FEDERAL COMMUNICATIONS COMMISSION
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Improving Public Safety Communications in the 800 MHz Band	)	**WT Docket No. 02-55**
	)	
Consolidating the 900 MHz Industrial/ Land Transportation and Business Pool Channels	)	

To: The Commission

COMMENTS OF ARRL, THE NATIONAL ASSOCIATION OF AMATEUR RADIO OPERATORS

ARRL, the National Association of Amateur Radio Operators, also known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.415 of the Commission's rules (47 C.F.R. §1.405), hereby respectfully submits its comments in response to the *Notice of Proposed Rule Making* (the Notice), FCC 02-81, released March 15, 2002. The Notice proposes to address increasing incidents of harmful interference to Public Safety communications systems at 800 MHz by soliciting proposals on how best to remedy such incidents. The Notice also, among other things, considers some allocations around 2 GHz for use as relocation spectrum for those entities which might suffer displacement, or loss of frequency assignments in the 800 MHz band, as a result of actions taken in this proceeding. On behalf of the more than 650,000 licensees in the United States in the Amateur Radio Service, ARRL submits the following comments.

1. The principal issues in the Notice, related to allegedly increasing incidents of interference to Public Safety licensees in the 800 MHz land mobile band, are of no concern to

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ARRL, as they have no direct impact on the Amateur Radio Service. However, Amateur Radio Operators work hand-in-hand on a daily basis with Public Safety entities, and would urge the Commission to take any and all steps necessary to preclude interference from cellular architecture SMR facilities which may be causing interference to 800 MHz Public Safety licensees. Too often, radio amateurs are called upon to provide fill-in communications for Public Safety operations during disasters, because of inadequate Public Safety facilities, and due to inadequate interoperability capabilities. While volunteer Amateur Radio operators are and will remain ready, willing and able to continue to provide these communications services, Public Safety system reliability is of critical importance during emergencies and disaster relief efforts. Disaster relief communications are difficult enough as it is, without the added burden of interference from CMRS systems in the 800 MHz band.

2. Other than that general observation, however, the concern of the Amateur Service in this proceeding is limited to the identification and possible specification of replacement spectrum which may be necessary as a part of any restructuring of the 800 MHz assignments. At paragraph 50 of the Notice, the Commission states that the willingness of a relocation proponent such as Nextel to compensate Public Safety entities and others for the cost of relocation may hinge on the availability of replacement spectrum for that given up by a relocation proponent. One of those candidate bands, discussed at paragraph 58 of the Notice, is the 2390-2400 MHz band, which the Commission refers to as the "Unlicensed PCS Band." The band is unavailable for relocation of Nextel or other CMRS services, and should not be under consideration in this proceeding.

3. That band is allocated on a Primary basis to the Amateur Service domestically. It is

allocated internationally in ITU Region 2 on a co-primary basis to the Fixed, Mobile, and Radiolocation Services, and on a secondary basis to the Amateur Service. Initially, the Amateur Service had secondary allocation status domestically in the band, and Government radiolocation was primary. The Federal government used the band for military radar testing systems, such as target scattering and enemy radar simulators.[1] Reallocation of the band to private sector use was completed on August 9, 1994 pursuant to Title IV of the Omnibus Budget Reconciliation Act of 1993 (OBRA-93).[2]

4. In implementing the reallocation of spectrum pursuant to OBRA-93, the Commission issued a series of Orders in ET Docket No. 94-32. The first of these, the *First Report and Order and Second Notice of Proposed Rule Making,* 10 FCC Rcd. 4769 (1995), addressed the immediate reallocations made by NTIA, including 2390-2400 MHz. The Commission noted therein that non-government use of the band was circumscribed in the view of the Department of Commerce by virtue of the National Astronomy and Ionospheric Center which operates a planetary research radar at Arecibo, Puerto Rico at 2380 MHz. In order to protect radioastronomy operations, the Department of Commerce stated that the 2390-2400 MHz band should not be used for airborne or space-to-Earth links, and that restrictions on terrestrial operations in the vicinity of the Puerto Rico planetary research radar facility may be necessary.[3] The comments filed in that proceeding strongly supported retention of the Amateur allocation at 2390-2400 MHz:

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[1] See, NTIA, Spectrum Reallocation Final Report, NTIA Special Publication 95-32, February, 1995, at p. 5-4.

[2] Pub. L. 103-66, 107 Stat. 312 (August 10, 1993).

[3] 10 FCC Rcd. at 4773.

> Amateur service commenters contend that sharing between commercial licensees and the Amateur service is generally not possible because of the density and location of commercial users. These commenters describe the important contributions that the Amateur Service makes by providing emergency communications, educational opportunities, and radio communications research. They contend that continued access to all or most of the 13 cm band is important to the Amateur Service, because the band provides an opportunity for growth as lower bands become increasingly congested or are allocated for services other than the Amateur Service...
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> 10 FCC Rcd. at 4774.

5. The Commission in that same Report and Order considered various commercial services that might be allowed access to the 2390-2400 MHz spectrum. These included wireless local loop service, in-flight aeronautical audio/visual service, private land mobile radio service, interactive video and data service, and non-geostationary mobile satellite service. 10 FCC Rcd. at 4774-4779. All of these commercial uses were ultimately rejected, however. Instead, the Commission accepted the negotiated proposal submitted jointly in the proceeding by ARRL and Apple Computer, Inc. which constituted a compatible sharing proposal: the 2390-2400 MHz band would be used by asynchronous unlicensed PCS, regulated under Part 15 of the Commission's Rules, and the band would be allocated on a primary basis to the Amateur Service.

6. As the Commission held in 1995 in the *First Report and Order and Second Notice of Proposed Rule Making, supra*, 10 FCC Rcd. at 4780:

> We will regulate these unlicensed PCS devices in accordance with Part 15 of our Rules. Devices operating under Part 15 have generally proven to be effective in operating in shared environments with other services, including in frequency bands shared with the Amateur service. We recognize the value of maintaining adequate spectrum for the Amateur service and we believe that the generally robust nature of PCS devices will make it feasible for unlicensed PCS devices and Amateur operations to operate on a shared basis in this band. In addition, both

> Apple and the ARRL believe that shared use of this band is possible (footnote omitted). Accordingly, we are providing for the continued availability of the 2390-2400 MHz band for Amateur operations, and are increasing the status of the Amateur service in this band to primary (footnote omitted). Considering past experience of Part 15 devices and Amateur service users operating in a shared environment, we do not believe that it is necessary to adopt specific provisions for protecting either of these operations.

The Commission went on to note that, while it had considered allocating the band for Fixed and Mobile services or for a number of specific services proposed by commenters in the Docket 94-32 proceeding such as AAVS, wireless local loops, and MSS, "we believe that use by new unlicensed PCS and continued use by the Amateur service represents the greatest opportunity for using this band to benefit the public." 10 FCC Rcd. at 4780-4781.[4]

7. The compatible sharing plan developed jointly between ARRL and Apple Computer, Inc. for the 2390-2400 MHz band was not an accident; it was carefully analyzed as a technical matter by engineering staff of both entities. The principal applications of data-PCS systems are indoors, and the power and antenna gain of such systems are limited pursuant to Sections 15.319-15.231 of the Commission's Rules. Only asynchronous devices are permitted in the band

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[4] The ultimate conclusion of the Commission was that the allocation decision would benefit the public in numerous ways:

> We believe that allocation of this band for unlicensed PCS will lead to the development of new and unique devices and applications that can be provided in a cost effective manner and will be available to virtually every person in the nation (footnote omitted). Such devices will increase American productivity by allowing business to operate more efficiently and will allow more people to access information in a variety of ways from almost any location. Amateur Service use of this band will allow these users to continue to develop radio communication technologies through experimentation, provide communications during emergencies and natural disasters, and provide education in the area of radio communication.

10 FCC Rcd. at 4781.

now, with minimum bandwidths of 500 kHz. Devices of less than 2.5 MHz bandwidth are required to search for an available window in the band. All devices must have a mechanism for monitoring the spectrum before transmitting. Significant attenuation is required near the band edges. Peak transmit power must not exceed 100 uW multiplied by the square root of the emission bandwidth in hertz. Power spectral density must not exceed 3 milliwatts in any 3 kHz bandwidth. Peak transmitter power must be reduced by the amount in decibels that the directional gain of the antenna exceeds 3 dBi.

8. It is these constraints that make asynchronous U-PCS fundamentally compatible with primary Amateur operations in the band. Those carefully crafted operating parameters are not duplicated by most other commercial services, and the Commission so found in Docket 94-32. The Commission specifically held, relative to 2390-2400 MHz that "an allocation for Fixed and Mobile use would be incompatible with continued use of this band by the Amateur Service." 10 FCC Rcd. at 4781. With respect to wireless local loop service, the Commission found it to be "incompatible with continued use of this band by the Amateur Service." *Id.*

9. The Commission has repeatedly noted its obligations under the 1993 Omnibus Budget Reconciliation Act [47 U.S.C. §§923(c)(1)(C)(iii)] to avoid disruption of existing use of Federal government frequencies by Amateur Radio licensees. While it has not always complied with that obligation, it is at least cognizant of it. In the "*Report From the Federal Communications Commission to Ronald H. Brown, Secretary, U.S. Department of Commerce, Regarding The Preliminary Spectrum Allocation Report*", FCC 94-213, released August 9, 1994, the Commission stated, with respect to both the 2300-2310 MHz and the 2390-2400 MHz segments:

The largest factor affecting use of these bands is their existing availability for use

> by the Amateur Service (footnote omitted). Congress specifically sought to avoid disruption of existing use of Federal government frequencies by amateur radio licensees (footnote omitted). We agree with commenters that there is a substantial likelihood that reallocation of the 2300-2310 MHz and 2390-2400 MHz band to commercial or local government use could cause serious disruption to Amateur service use of these bands.
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> *Id.*, at 17.

The same essential holding was included in Docket 94-32 in the *Notice of Proposed Rule Making*, FCC 94-272, released November 8, 1994, when the decisions regarding allocation of the 2390-2400 MHz band were being made:

> Both the 2390-2400 MHz and 2402-2417 MHz bands are currently available for secondary use by the amateur service. The Reconciliation Act directed the Department of Commerce to seek to avoid excessive disruption of the amateur service and to determine the extent to which, in general, commercial users could share the frequency (sic) with amateur radio licensees (citation omitted)...We recognize the importance of the amateur service and, in making our allocation decisions, we will take into account existing use of the spectrum by the amateur service...
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> *Id.*, at paragraph 20.

10. Given as a preface all of the foregoing, the Commission asks in the instant Notice, at paragraph 58, whether the band 2390-2400 MHz is subject to sharing between Amateur Radio and relocated 800 MHz services, and if not, whether incumbent Amateur operators could be relocated, and if so, where. Based on the allocation status of this band, and the specific findings of both the Commission and NTIA regarding the difficulty of sharing between Amateurs and commercial services (other than the carefully limited operating parameters of U-PCS), it is a simple matter to conclude that there is no compatibility between displaced 800 MHz incumbents and Amateur licensees in this band. This conclusion was already reached. The Commission has

asked recently whether Amateurs could share this band with Advanced Wireless Services.[5] It is largely conceded that such sharing is impossible. For the same reasons, sharing between 800 MHz incumbents and radio Amateurs at 2390-2400 MHz is incompatible.

11. Sharing between the Amateur Service and commercial services, especially mobile commercial services, is extremely difficult generally, due to the shared frequencies within Amateur bands; the essentially mobile or itinerant character of Amateur stations; relatively high Amateur transmitter power levels, and extremely sensitive receivers. As noted (relative to the 2300-2310 MHz band) in the NTIA Final Spectrum Allocation Report, NTIA Special Publication 95-32, February, 1995, at Appendix B:

> Sharing between Federal Government users and the amateur service has been successful largely because Federal operations are generally located outside of highly populated areas (citation omitted). It is very unlikely that the Amateur Service will enjoy an analogous situation with a commercial or other private sector service. If commercial services are to share with the weak signal operations located at 2303.75 - 2304.75 MHz, they must be able to withstand potential interference from the high-powered transmitters used for those operations, but not create interference to the sensitive receivers used. This is something of a contradiction that tends to point to relatively low powered devices that operate over short distances, such as devices authorized under Part 15 of the Commission's Rules, or to operations with a lower density of use that may be located in relatively remote areas. Similar operations should also be compatible with amateur service fixed operations, as would commercial fixed operations that can be coordinated with amateur systems.

While some types of fixed, point-to-point amateur operation can be coordinated with other, lower powered, licensed, fixed commercial facilities, amateur television and mobile data communications, both of which are conducted in and are well-suited to the 2390-2400 MHz band, cannot be coordinated with non-Amateur fixed or mobile facilities, and therefore are

[5] See, *Advanced Wireless Services Further NPRM*, 16 FCC Rcd. 16043 (2001).

fundamentally incompatible.

12. ARRL is not prepared to speculate on relocation spectrum for the Amateur Service if the Primary Amateur Radio allocation is modified in this proceeding or in the Advanced Wireless Services proceeding, and if Amateurs are displaced from 2390-2400 MHz. The Commission has, over the years, winnowed the Amateur Allocation between 2300-2450 MHz to the point that the Amateur Service has very little access to the Amateur allocations remaining in that range. Some reaccommodation might be made if the Commission, as ARRL has requested repeatedly over the past five years (See, e.g. RM-10165, now pending) allocates the 2300-2305 MHz band on a primary basis to the Amateur Service. While that would be, at best, an incomplete solution for the Amateur Service, it might contribute to the availability of some portion of the 2390-2400 MHz band for displaced 800 MHz licensees.

Therefore, the foregoing considered, ARRL, the National Association for Amateur Radio, respectfully requests that the Commission's decision in this proceeding reflect the foregoing

comments, and that the 2390-2400 MHz band not be considered for accommodating displaced 800 MHz incumbent licensees.

Respectfully submitted,

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