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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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In the Matter of: )  
)  
Petition for Rulemaking to Allocate )  
the 5,1 - 5.35 GHz Band and Adopt )  
Service Rules for a Shared Unlicensed )  
Personal Radio Network )

RM-8648

In the Matter of )  
)  
Allocation of Spectrum in the )  
5 GHz Band To Establish a Wireless )  
Component of the National Information )  
Infrastructure )

RM-8653

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COMMENTS

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COMMENTS

AT&T respectfully submits the following comments on the Petitions for Rulemaking ("Petitions") filed by Wireless Information Networks Forum ("WINForum") and by Apple Computer, Inc. ("Apple")<sup>1</sup> proposing allocation of spectrum for unlicensed high-speed wireless data.<sup>2</sup>

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<sup>1</sup> The Commission's Order Extending Time in RM-8648, DA 95-1254, released June 8, 1995, requested consolidation of comments on both Petitions in a single pleading wherever practicable.

<sup>2</sup> WINForum calls its proposal SUPERNet (an acronym for Shared Unlicensed Personal Radio Network) while Apple calls it the NII Band (NII is National Information Infrastructure).

I. SUMMARY

The Commission should allocate several hundred megahertz of spectrum in the 5 GHz band for unlicensed, high-speed, wireless data transmission under the principles urged by WINForum. The specific frequencies proposed by WINForum are more appropriate than those earlier proposed by AT&T and those currently proposed by Apple.

WINForum's concept of short-range, predominantly indoor, usage supports wideband, high data rate applications, facilitates efficient spectrum re-use and maximizes the ability of many different kinds of devices to share the band. Moreover, the WINForum proposal does not artificially constrain the kinds of applications permitted in the new spectrum and calls for broad industry consensus to develop the necessary technical rules and standards.

On the other hand, Apple's high power, long range, community network proposal will likely resemble a licensed service, and will threaten the development of licensed PCS services and the ability of MSS feeder links to operate in the band. Moreover, the Apple concept is spectrally inefficient and limits user choice of technology and applications.

II. THE COMMISSION SHOULD INSTITUTE A RULEMAKING PROCEEDING TO ADOPT WINFORUM'S SPECTRUM ALLOCATION PROPOSAL

WINForum and Apple seek allocation of similar amounts of spectrum, with some overlap regarding the specific frequencies. The Petitions are not, however, identical in this regard, and AT&T's separate proposal in the WRC-95 proceeding<sup>3</sup> overlapped the other two only in part. In tabular form, those proposals are:

	<u>Frequencies</u> (in MHz)		
WINForum	5100-5250	5250-5350	
Apple		5150-5300	5725-5875
AT&T 5000-5100	5100-5250		

All three proposals recognize that at least 250 MHz in the 5 GHz range is needed now and that spectrum between 5.0 and 5.25 GHz will be available as the United States transitions away from planned use of Microwave Landing Systems ("MLS") at most airports.

As the foregoing table shows, the parties made slightly different judgments as to how much of that spectrum could be reallocated to high-speed wireless data. AT&T sought all of it, subject to the qualification that the 5.0-5.1 GHz portion be available only for non-nomadic wireless

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<sup>3</sup> Matter of Preparation for International Telecommunications Union World Radiocommunication Conferences, I C Docket No. 94-31.

systems that would be located away from the small number of airports using MLS. WINForum, rather than accepting the need to accommodate MLS systems between 5.0 and 5.1 GHz, suggests that 100 MHz could be obtained by sharing with the government radiolocation service between 5.25 and 5.35 GHz. Apple makes a slightly different judgment, seeking 100 MHz in the band that will not be occupied by MLS and 50 MHz by sharing with the government. Apple makes up the shortfall by seeking 150 MHz between 5.725 and 5.875 GHz, for a total of 300 MHz.

Because high-speed wireless data applications are quite likely to need more than 250 MHz in the future, AT&T would not object to an allocation of 300 MHz at this time. However, Apple's particular proposal should not be adopted. Industrial, Scientific and Medical ("ISM") equipment is permitted to operate in the 5.725-5.875 GHz band on a superior basis to unlicensed high-speed wireless data use. The delays inherent in considering and resolving current and potential conflicts between these two uses demonstrate that this aspect of Apple's proposal does not fulfill the need to move forward now on a spectrum allocation for the wireless operation all three parties seek.

A second objection to 5.725-5.875 GHz for high speed wireless data is that that band is presently available to spread spectrum Part 15 devices. Apple concedes that the

Part 15 devices will have to conform to NII Band rules, and predicts that "slight adjustments" in Part 15 products may be required in only "a limited number of cases" (id.). Surely, Part 15 devices would have to conform to the SUPERNet etiquette if the 5.725-5.875 GHz band were allocated for that purpose. AT&T is concerned that such adjustments may not be as easy as Apple suggests. Because of the many valuable contributions made by Part 15 devices, recognized in several recent Commission decisions,<sup>4</sup> allocating spectrum used by those devices to a use that may well cause difficulties should be avoided.

Thus, if the government spectrum at 5.25-5.35 GHz can be made available, the WINForum spectrum allocation proposal is the best of the three. It does not have the constraint of only non-nomadic use of part of the spectrum because of the need to avoid interfering with some MLS systems, which is an aspect of AT&T's initial proposal. It does not seek to use spectrum that may not be readily shareable with incumbent users, which is an aspect of Apple's proposal.

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<sup>4</sup> Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, Report and Order, FCC 95-41, released February 6, 1995, at ¶ 34; Allocation of Spectrum Below 5 Ghz Transferred from Federal Government Use, Report and Order, FCC 95-47, released February 17, 1995, at ¶ 32.

III. THE RULEMAKING TO BE INSTITUTED BY THE COMMISSION SHOULD EMBODY WINFORUM'S SUPERNET CONCEPT AND NOT APPLE'S NII BAND CONCEPT.

Although the immediate issue raised by the Petitions is allocation of several hundred megahertz of spectrum in the 5 GHz band for high-speed wireless data transport, WINForum and Apple also set forth differing visions of how the proposed spectrum would be used. WINForum explains that SUPERNET will meet internal communications demands, permit wireless access to the broad band wired network and allow short term internetworking between "units in close proximity" (p. 9). Accordingly, WINForum proposes that SUPERNET devices "be subject to low-power operational limitations" to minimize interference (p. 19). These attributes fit well within the concept of unlicensed operation, facilitate efficient spectrum re-use based on spatial separation between different groups of users, and maximize the opportunity for many different kinds of devices to share the band.

On the other hand, Apple's "community networks" proposal for the NII band allows "groups of users" to create a "community-wide network" which would "as a unit" interconnect with the broader infrastructure (p. 18) -- and which presumably would have to be centrally managed and

controlled.<sup>5</sup> The unlicensed NII Band proposed by Apple will resemble a licensed service and thus could conflict with the Commission's objectives in the recently completed auction of spectrum to be used for licensed PCS service.

The Commission should not seriously devalue the spectrum it has already sold or intends to sell by permitting the offering of similar service by parties who paid nothing for use of spectrum. That consequence, an easily foreseeable result of adopting the Apple concept, will jeopardize the ability and incentive of PCS licensees to construct and operate their networks and offer to the public the plethora of new services that is the promise of PCS.

In addition to threatening the development of licensed PCS, the Apple concept imperils the usefulness of the 5090-5250 MHz band for licensed MSS feeder links in the Earth to space direction, which the Commission has proposed

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<sup>5</sup> Apple does not explain how these "groups of users" manage to organize themselves and how they can prevent others from simply buying an unlicensed device and then "free-riding" on the efforts of the creators of the community network. These problems are exacerbated by Apple's information that the NII Band will permit communications "at distances on the order of 10 to 15 km or more" (p. 18). The site interconnection required for Apple's community network proposal is not an optimum use of scarce spectrum available for wireless operations. Cable, fiber or microwave radio links would be more suitable.

in the WRC-95 proceeding.<sup>6</sup> Unlicensed operations cannot be coordinated with licensed services, but such coordination would be very important in the case of the significant outdoor use and relatively high EIRP required to achieve the range contemplated by Apple. On the other hand, the lower powered, shorter range, equipment specified by WINForum will not have to be coordinated with the MSS feeder links.

IV. THE TECHNICAL RULES APPLICABLE TO THE NEW SPECTRUM SHOULD BE BASED ON WINFORUM'S PROPOSALS, NOT APPLE'S.

Although both the WINForum and Apple proposals afford users substantial flexibility in using the new spectrum, the relatively few constraints proposed by the petitioners are not congruent. WINForum proposes that the available spectrum be subdivided into about 10 channels (p. 17)<sup>7</sup> while Apple urges that there be no "band subdivision," so as not to preclude some uses while affording other uses too much spectrum (p. 17). While the flexibility afforded by Apple's proposal is attractive, AT&T is persuaded by WINForum's explanation that channelization

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<sup>6</sup> Report, FCC 95-26, released June 15, 1995, at ¶ 49, Table 2.

<sup>7</sup> WINForum commits to further study of permitting channel widths of integer multiples of the standard width (n.9) and explains why also allowing narrower channels would reduce spectrum utilization (n.10).

optimizes the usefulness of the spectrum (pp. 17-18).

Moreover, the channelization suggested by WINForum fosters use of the spectrum for high-speed transmission: low and medium speed applications can be served by other means.

Apple explains that its NII band permits only what it calls "'connectionless' information transport" and that there is no role for "centralized 'gatekeepers'" (p. 25) or a "hegemonic controller" (p. 26). The WINForum Petition does not contain these specifications. While SUPERNet will often be used for connectionless packet data transmission, some connection protocols and centralized control aspects may also be required in order also to permit interactive multimedia applications. These questions are not ripe for precise technical resolution at this time. It is therefore important that the rulemaking which both Petitions urge not prejudge or preclude industry consensus on connection and control issues, and thus not adopt Apple's proposal (p. 27) to exclude possible telecommunications and entertainment industry applications.

For similar reasons, as both parties agree, standards in this area should emerge from industry consensus, rather than Commission mandate. WINForum states that it has begun to set the foundation for "joint industry action" through a "consensus process" (p. 19). AT&T is active in WINForum and knows that that group is composed of

information and communications industry members. On the other hand, Apple apparently proposes (p. 28) that the rules "should be developed by the information industry". At this time, the Commission need only insure that the communications industry, which has a vital role to play regarding use of this new spectrum, is not shut out of the standards development process.

V. CONCLUSION

Both WINForum and Apple demonstrate that at least 250 MHz of spectrum should be allocated for unlicensed high speed wireless data transmission in the 5 GHz band. Therefore, the Commission should institute a rulemaking proceeding proposing such an allocation. The specific frequencies proposed by WINForum should be proposed therein. Although the general concepts and technical rules applicable

to the spectrum so allocated will be further developed, WINForum's proposals, rather than Apple's, should be the primary basis for that development.

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