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

JUL 25 1995

FCC MAIL ROOM

In the Matter of	)	
	)	
Allocation of Spectrum in the 5 GHz Band To Establish a Wireless Component of the National Information Infrastructure	)	RM-8653
	)	
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

DOCKET FILE COPY ORIGINAL

REPLY COMMENTS OF DEWAYNE HENDRICKS

I wish to submit these reply comments to the petition for rulemaking filed by Apple Computer, Inc. ("NII Band Petition"), and by the Wireless Information Networks Forum ("WINForum Petition), in the above referenced matters. I am filing as an individual and a long time member of the amateur radio service (ARS).

Upon examination of the many comments that were filed in this docket, it would appear that the vast majority of those who filed are in favor of the Apple petition as opposed to that of WINForum. In addition, we are aware that the Commission has allowed comments on this docket to be submitted via electronic mail. We support the Commission's action in allowing comments to be filed in this manner as it will serve to broaden the scope of this proceeding to the public at large. We are aware of many people on the Internet who have said that they will take advantage of the FCC's offer to file comments electronically. However, as a result of this action, it would appear that all of the comments that have been filed on this matter will not be available for public examination until after the date for filing reply comments.

As stated in my comments on this matter, I again wish to state my strong support of the Apple NII Band Petition and urge the Commission to take the necessary actions necessary to make this proposal a reality as soon as possible.

No. of Copies rec'd 0+9
List A B C D E

For my reply comments, I have taken excerpts from the comments that have been filed to date that I feel bear some comment. In what follows, the excerpts are in italics and my comments follow each section in normal type.

AMERICAN RADIO RELAY LEAGUE

"[T]he longer-distance communications described in the Apple petition should be accomplished by use of licensed services, such as fixed, point-to-point microwave, for community networking and similar applications. Alternatively, PCS and existing wireline and wireless service providers can fulfill the same functions envisioned by Apple.

While it is true that some of the uses of the NII Band that Apple proposes in its petition could be provided by some of the existing licensed services, I believe that the ARRL has missed the point of the need for a unlicensed service to provide some of these same things. Apple has gone to great detail in its petition to spell out just why a new unlicensed service is necessary. It would appear that the ARRL has chosen to ignore those arguments. I will not duplicate their arguments here other than to say that I hope that Apple spends some time in there reply comments going into greater detail as to how existing licensed services could not provide the services to the general public that they envision.

"Apple envisions a radio service occupying 300 MHz of valuable microwave spectrum which has no regulation at all, save for some vague inter-device compatibility based on packet protocols, which will substitute for frequency assignments, coordinated operation, and any medium access or frequency re-use regulation. ..."

This seems to me to be a strange comment to come from the ARRL. After all, you could use that same phrasing to describe the Amateur Radio Service. The ARS operates under a minimal set of regulations. Every amateur is free to do what they wish under those regulations, which means that they can transmit just about anywhere that they wish in the allocated amateur spectrum, with whatever transmission method they choose. This approach to spectrum usage has been working for about ninety years now in the ARS. In seems strange to me that the League doesn't feel that it could work for another new service.

"[T]he Apple petition, though it offers a thoughtful concept, is not ready for serious consideration by the Commission. It is as if Apple is

saying to the Commission: 'We have a good idea, but we don't know whether or not it will work; you figure it out, but don't postpone making the allocation in order to do so; we want it now.' The petition is defective and must be dismissed."

I don't believe that this statement correctly reflects the content of the Apple petition. If you look at where Apple started back on this notion of unlicensed spectrum with their Data-PCS petition in 1991, one can see that the NII Band petition follows in that tradition. The Data-PCS petition resulted in the formation of the WINForum organization a wide-scale industry effort to define the new service and finally Subpart D of the Commission's Part 15 rules.

I think that the League should take some time to acquaint itself with this history and take a good look at Part 15 Subpart D. It might then realize that there has been a good deal of thought an effort behind this petition and that Apple is not asking for the FCC to figure anything out.

APPLE COMPUTER

"The Commission's obligation to allocate spectrum in the public interest cannot be 'delegated' to an auction. The Commission must use its judgment to determine which spectrum allocations are in the public interest - for example, as it did recently in allocating spectrum for global 'Big LEO' satellite systems without relying on an auction. In addition, auctions are particularly unsuited to determining the value of unlicensed spectrum. Market-based mechanisms, such as auctions, universally undervalue public goods (such as unlicensed spectrum) because, by definition, no entity owns the resource (i.e., has the right to exclude others) and, therefore, no bidder or group of bidders has an adequate incentive to pay market value for the resource.

"It has been suggested that a group of manufacturers could join together and collectively purchase 'unlicensed' spectrum at an auction. In such a case, however, the spectrum would lose its essential attribute - it would no longer be open to all users on an equitable, non-preclusive basis, but rather would be 'owned' by a group of manufacturers, who might (or might not) permit others to use it for a fee. By analogy, it would be a country club, not a public park. And while country clubs have value (at least to those who can afford to join), they are fundamentally different from public parks."

We find that Apple has done a very good job in its comments in

expanding upon the concepts put forth in its petition. We agree that that the spectrum for this new service should not be auctioned.

AT&T

"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. ...

"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.

"While the flexibility afforded by Apple's proposal is attractive, AT&T is persuaded by WINForum's explanation that channelization optimizes the usefulness of the spectrum. 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' or a 'hegemonic controller'. 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 to exclude possible telecommunications and entertainment industry applications."

The comments of AT&T represent in my mind the major source of opposition to the Apple petition of all of the comments that have been filed that I have seen. This is to be expected as AT&T is really the

author behind the WINForum petition.

Both petitions represent different ways of viewing the world. When industry attempted to sort out the diverse issues between voice and data at the time of the Data-PCS deliberations, they were basically unsuccessful and had to split the band allocation into both voice and data bands. Its sort of like the Hatfields and the McCoys feuds. I don't think that it will ever be resolved.

The short form of this battle is that data companies don't see that need to have complete control of the band. Voice companies do. No one here is right or wrong. It's just the way it is.

I support the Apple petition because I think that in the long run, that is the best way for everyone to treat spectrum. All for one and one for all!!!

CENTER FOR DEMOCRACY AND TECHNOLOGY

"The unlicensed wireless service as proposed in Apple Computer's NII Band Petition is in the public interest inasmuch as it: 1) promotes ubiquitous, affordable access to the NII for citizens around the country, 2) increases the diversity of information sources available on the NII, and 3) forms a platform for a vibrant new public forum for political discourse at a local and national level. ...

"We would place special emphasis on the equal access goal cited in Apple Computer's Petition and would also add an explicit requirement that NII Band services incorporate bi-directional communication for all users as a part of the basic service available to individual users."

I add my support to the issues raised in the comments of the CDT. Their comments serve to better define the notion of just what an NII Band is. I urge the Commission to read these comments very carefully as they consider just what are the next steps to take this proceeding.

DUNCAN, WEINBERG, MILLER & PEMBROKE P.C.

"Apple's Petition describes a service that could benefit state and local government in meeting their communications needs, particularly because of the capacity of the technology and the equal access to it. ...

"The FCC Public Notice...announcing the receipt of Apple's Petition and inviting public comments does not effectively put the public on notice, except as a matter of law. Nor does the notice highlight the importance of Apple's Petition and encourage input. As a result, the Commission's processes suffer from lack of participation."

This is a very important filing. I had not thought about the potential use of the NII Band by state and local governments. However, this filing has made it clear to me that there is a very great need by state and local governments for unlicensed spectrum. I urge the Commission to pay great attention to these comments in their deliberations as to how to proceed with action on these petitions.

FEDERAL AVIATION ADMINISTRATION

"The FAA does not agree that WINForum has made a case for the 'requirement' for a wireless network. We are also not convinced that the 5 GHz band is the only location for such a system. ...[T]he airport environment may be just the place where such devices could proliferate, causing interference to sensitive navigation systems on the aircraft moving about on the ground or on final approach. The potential for interference with critical aeronautical safety of life navigation systems must be avoided. ...

"With respect to the use of 5 GHz, the microwave landing system (MLS) is not being phased out by the United States in favor of differential global positioning system (GPS), as alleged by WINForum in their petition. In fact, there are plans for at least 26 MLS installations and possibly many more... In addition, the U.S. Department of Defense has significant MLS installations."

The FAA makes many useful comments in their filing. Whatever happens in this band, the needs of the FAA will have to be addressed. I would hope that Apple and WINForum will give this area of concern adequate attention in their reply comments.

METRICOM

"Metricom is anxious to expand its service offerings and to adapt its technology to operations in other frequency bands which provide a friendlier environment and a greater possibility for growth and

expansion than is currently possible in existing unlicensed bands. "Metricom does not support the WINForum Petition as it does not appear to favor technical rules that would foster equitable entry and operation of all types of services."

Metricom is one of the few companies today who has taken the risks necessary to roll out a commercial wireless data service in unlicensed spectrum. For this, they deserve to be treated as true pioneers. The types of services that they offer today are the very same sorts of services that I see being made available in the NII Band.

There are some who have said that a wireless service such as Metricom's uses more spectrum then is fair or proper for an unlicensed service. I disagree with this assessment. They have made a fair and unique use of the current Part 15 rules. I believe that what Apple is suggesting for the rules of the road in the NII Band will allow services such as Metricom to continue to operate and provide useful services while the spectrum is being shared on an equal basis with other unlicensed users.

MICROSOFT

"Microsoft believes the initial allocation should be at least 300 MHz since that will assure an adequate amount of spectrum for initial applications. Moreover, the Commission must also assure an adequate reserve of at least 50 MHz so that as usage increases wireless capacity will make high-speed connections possible (13-26 Mbps) and wide enough to enable cooperative sharing of frequencies through spectrum efficient technologies such as variable bit-rate spread spectrum technology.

"Microsoft also believes that unlicensed frequencies should not be auctioned but instead should be open to all who seek to use that spectrum. If access to these frequencies is auctioned, ubiquitous access to the NII will not happen and will not be available to all at the lowest cost possible.

"It is premature to specify much about the technology to be deployed. The allocation approved by the Commission should have a minimal set of rules attached to it and must be flexible enough to accommodate both channelized access and broadband spread spectrum techniques. Power and antenna constraints should be flexible to enable useful coverage areas so that a single device could provide neighborhood or campus-wide access or powered at a low level for wireless LAN

services. ...

"Microsoft urges the Commission to seize this historic opportunity to allocate wireless data spectrum of at least 300 MHz with an adequate reserve. Now is the time to begin a rulemaking to enable the Internet and electronic information publishing - the 21st century equivalent of the impact of Gutenberg's printing press - to flourish and empower a better America."

It is good to see Microsoft come out in support of the NII Band. They make a very good point about the need for more than 300 MHz in the long run for this type of service. When Sun Microsystems filed in support of the Apple Data-PCS petition in 1991, they asked that the Commission set aside 400 MHz for the unlicensed Data-PCS service. As we see, Apple is now asking for 100 MHz less than Sun requested just four years ago. I think that Microsoft's comments show that there is a recognized need for a vast amount of spectrum for unlicensed data services. When the Commission acts on this matter, they should take these needs into account and insure that they is an adequate spectrum set-aside for future needs. Let's try to do it right the first time around!!!

MOTOROLA

"The 5 GHz band appears to be ideal for the next generation of computer-to-computer communications. There is a significant amount of spectrum that could be made available with the transition from aeronautical microwave landing systems (MLS) to differential GPS to support high data rate communications. Unlike higher bands, the 5 GHz frequencies also appear to be commercially feasible given the anticipated state of the art for next generation unlicensed devices.

"As both petitions observe, Europe has already begun the process of allocating spectrum for, and defining, next generation unlicensed products. In particular, CEPT has allocated spectrum for HIPERLAN and recently published an initial proposal for a HIPERLAN protocol. If domestic companies are to compete for worldwide radio LAN markets, and if domestic users are to reap the competitive benefits of wireless, multimedia computer applications, it is critical for the U.S. to take similar steps."

These are very important points about the need to have spectrum allocated in the US to match that used in Europe for HIPERLAN. If we are going to have a world-wide market in this area,

then we are going to need a common world-wide spectrum allocation. Both the Apple and WINForum petitions address this requirement and the Commission should act upon this key requirement.

NORTHERN AMATEUR RELAY COUNCIL OF CALIFORNIA

"They are asking permission to create a proprietary network without paying for it. Other wireless carriers have paid unprecedented sums for our precious spectrum. If they take the lead role in defining a transmission system, it would then be patented and licensed to other users. Nothing wrong with that but their entry into the spectrum cost them nothing."

This appears to me to be just another "knee-jerk" defense by the amateur radio community to protect what it feels to be its "property rights". Apple has gone to great lengths to point out that the NII Band will not be a domain of proprietary technologies. I do not view the Apple or WINForum petitions as being just spectrum "land grabs". Both petitions build upon the efforts which started in 1991 and used arguments which the Commission supported when they granted free spectrum for unlicensed Data-PCS. The amateur radio community should acquaint themselves with those proceedings before they make these sorts of critiques.

BRUCE PERENS

"Apple states that the operating conventions and rules for the NII Band should be developed by the information industry. They ignore that community radio networks have been operated for 15 years by the Amateur Service, and that many of the problems of operating such networks have already been dealt with by Radio Amateurs.

I agree with this statement and I have said much the same in my comments. The ARS should serve as a good model for just what could be possible in the NII Band.

"Although Apple actively cooperated with the American Radio Relay League during the recent 2400 MHz PCS proceedings, they did not seek the cooperation of Radio Amateurs by consulting them before filing this petition."

This I'm sorry to say is true. However, this has now been pointed out to Apple and they are taking steps to start a dialog with the Amateur Radio community in order to develop a consensus as to how parts of the NII Band can be shared in the future with the ARS.

SOUTHERN CALIFORNIA REPEATER AND REMOTE BASE ASSOCIATION

"The petitioner apparently wants to obtain 'free' spectrum for 'free' and make large amounts of money selling equipment onto what can easily become a digital CB band. The petitioner apparently wants to circumvent both the licensing process and the fee process whereby a commercial use pays some resemblance to both costs and value for the spectrum.

I do not agree with this statement at all. One could ask just this same question of the ARS. What justification does the ARS have for all of the spectrum that is allocated to its use for "free"? I think that the answer to that question has to come out of the type of usage expected of the service and just who will benefit. The ARS probably will be asked at some time in the future to justify its usage of "free" spectrum. That time may come quite soon if the ARS continues to lobby against the creation of an NII Band. I have already seen some amateurs taken to task on the Internet by members of the general public who question why hams should have access to spectrum for free while they cannot.

"The petitioner indicates that the expected cost of the devices for this band will place them well within reach of individuals with even modest incomes. The potential for these devices to be sold by the local computer superstore along with every computer as an inexpensive way to gain access to the digital network is a scary thought. We urge the Commission to act to prevent a reoccurrence of the CB horrid mess from happening to any new unlicensed allocation."

I don't believe that the comparison of the NII Band to the Citizen's Band is a correct one. If you again look at the Part 15 Subpart D rules, you can see how industry has taken step to create spectrum access rules that are fair for all players. This tradition will continue in the NII Band and I would not expect it to mirror the problems that we saw in the Citizen's Band.

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

"Apple contemplates that the NII Band would be used to provide point-to-point and other services over distances of 10-15 km or more. ...Given the considerable need of mobile users for low frequency spectrum, the creation of a new low frequency allocation for short-distance, fixed point-to-point service would be totally inappropriate and unnecessary. Indeed, there is more than adequate spectrum allocated for FS [fixed service] in the 18, 23, 28 and 38 GHz bands to satisfy such mobile user needs. Thus, the proposed unlicensed point-to-point application specifically must be excluded from the new mobile service contemplated in the Petitions."

I do not agree with TIA's conclusions as state above. I believe that Apple has covered the reasons for the need of a point-to-point unlicensed service in their petition and comments.

WIRELESS INFORMATION NETWORKS FORUM

"Both petitions agree that the 5 GHz unlicensed device allocation should be based on packet-switched model of transmission, with a protocol governing the interaction of devices used in the band to be set through an industry consensus process. As the development of the spectrum etiquette for unlicensed PCS devices demonstrates, however, refining the details of the protocol is not prerequisite to beginning the allocation process. ...

"WINForum's advocacy of a new allocation at 5 GHz should not be viewed as a repudiation of the need for other unlicensed device allocations. WINForum has been, and will continue to be, a strong supporter of unlicensed PCS devices in the 2 GHz range, which should soon reach market.

"However, present allocations are insufficient to support the intense demands of multimedia technology. WINForum also does not view the proposed 5 GHz allocation as exclusive with the proposals for computer-to-computer communications in the bands above 40 GHz. However, at this time, WINForum does not believe that equipment is, or will soon be, available to support low cost devices in those regions. In addition, the bands above 40 GHz, compared with 5 GHz, suffer tremendous rain fade problems that have yet to admit a technical solution allowing campus-area unlicensed operation."

It is good to see that WINForum did not file any objections to

the Apple petition and that their comments spoke to the common ground between both petitions. I would hope that this spirit of cooperation will continue in the future if these two petitions take the next step in the rulemaking process.

For the reasons stated herein, I wish to express my continued support of the petition for rulemaking filed by Apple Computer, Inc.

Respectfully submitted,

Dewayne Hendricks WA8DZP

Warp Speed Imagineering
43730 Vista Del Mar
Fremont, CA 94539-3204
(510) 657-5616

July 24, 1995