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

In the Matter of)

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

RM-8653

DOCKET FILE COPY ORIGINAL

To: The Commission

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
IN RESPONSE TO PETITION FOR RULE MAKING

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SUMMARY

The American Radio Relay League, Incorporated (the League), the national association of amateur radio operators in the United States, submits its comments in response to the Petition for Rule Making (the Petition) filed on or about May 24, 1995 by Apple Computer, Inc. (Apple). The petition requests that the Commission allocate spectrum at 5150-5300 MHz and 5725-5875 MHz to an unlicensed Part 15-type radio service that would be essentially unregulated, save for certain technical rules, but which would be used for long- and short-distance wireless video, voice and high-speed data applications. The Amateur Radio Service presently has access to and expects continued compatible shared use of the entire 5650-5925 MHz band.

Apple is seeking a 300 MHz allocation, but it has not justified any allocation at all. Its petition proposes frequencies outside the international table of frequency allocations internationally. The petition contains no showing why 300 MHz is necessary; why existing allocations are not sufficient for the proposed communications; why this proceeding should not await the resolution of Docket 94-124, to determine whether frequencies above 40 GHz are sufficient for the proposed high-rate data transfer; and why existing services, such as licensed and unlicensed PCS, and other wireless and wireline services are not sufficient for the proposed use. Neither is there any compatibility showing relative to other services, existing and planned, in either 150 MHz segment sought by Apple.

The concept of the petition is also subject to question. Apple proposes the use of directional antennas and relatively high power, and protected allocation status in shared bands, for an unlicensed service to be used by non-technical persons, without access regulations whatsoever. The power levels and communications paths, and the use of shared bands as envisioned by Apple, justifies use of licensed facilities rather than as the petition proposes.

In short, this Petition is not in a form which can be acted upon by the Commission. It fails to justify the relief requested, and contains no substance in terms of technical justification or interference analysis. Furthermore, it is premature in light of actions proposed at WRC-95 by the Commission, and in view of the pendency of Docket 94-124. It should be dismissed forthwith by the Commission.

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**COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
IN RESPONSE TO PETITION FOR RULE MAKING**

The American Radio Relay League, Incorporated (the League), the national association of amateur radio operators in the United States, by counsel and pursuant to Section 1.405 of the Commission's Rules, hereby respectfully submits its comments in response to the Petition for Rule Making (the Petition) filed on or about May 24, 1995 by Apple Computer, Inc. (Apple).¹ The petition requests that the Commission allocate spectrum at 5150-5300 MHz and 5725-5875 MHz to an unlicensed Part 15-type radio service that would be essentially unregulated, save for certain technical rules, but which would be used for long- and short-distance wireless video, voice and high-speed data applications. In the interest of the Amateur Radio Service in continued access to and compatible

¹ Public notice of the filing of the petition was given by the Commission June 8, 1995 by public notice, and the comment date was consolidated with that for RM-8648, filed by WINforum, which related to the same concept as does the Apple petition. See the Order Extending Time, DA 95-1254, released June 8, 1995. These comments are timely filed in response to that Order.

shared use of the entire 5650-5925 MHz band, the League states as follows:

I. Overview

1. The Apple petition is amorphous, in that it does not propose any specific rules changes (other than amendment of the Table of Frequency Allocations, 47 C.F.R. §2.106, to make spectrum available for the proposed new service). It contains no technical showing to support the proposed allocation whatsoever; and there is no showing of compatibility between the so-called "NII" (National Information Infrastructure) band² allocation proposed by Apple, and existing Government and non-government users (including Part 15, Part 18 and Part 97 users). The petition is rife with glowing predictions of universal access by the public for whatever communications purposes are desired, but it contains no real information about the possibility of coordination of use between and among unlicensed users in the bands, or coordination between and among inter-service users. It contains only the vaguest references to compatibility with existing services in the 5150-5300 and 5725-5825 MHz bands. One can only conclude from the proposed absence of any proposed operational rules and the lack of any technical compatibility showing that there is in fact no possibility of coordination, and that the opportunities for

² It strikes the League that this is a uniquely inappropriate appellation for the allocation; the appropriation by Apple of the concept of the National Information Infrastructure concept reveals a misunderstanding of the concept of NII, which is a far broader concept for telecommunications access than the microcosmic proposal of Apple in this petition.

compatible sharing are little more than hopeful, but baseless, predictions. Neither does the petition contain an adequate discussion of alternatives to the specific allocations proposed in the petition; Apple indicates that the proposed 5 GHz allocations would be used both for long³ and short distance communications, but does not establish that frequencies above 40 GHz would not be sufficient (or indeed preferable to the 5 GHz bands proposed) for short-range paths.

2. Finally, the petition hints at, but does not specifically propose, what Apple has referred to as a "Part 16" allocation: the creation of a radio service with specific, protected allocations, but which is unlicensed and essentially unregulated. The concept of "community networks" and local area networks as Apple proposes appears better facilitated by the use of existing services such as private, fixed point-to-point microwave facilities now licensed by the Commission under Part 94; by frequencies above 40 GHz; by licensed and unlicensed PCS facilities for which the Commission has just allocated a substantial amount of spectrum at and near 2 GHz; and by existing wireline facilities. In any case, Apple does not provide any legal basis or justification under the Communications Act or the ITU Radio Regulations, for the creation of such a concept. It is impossible for the Commission to make an allocation for the type of radio service that Apple seeks under the terms of the current Communications Act requirement for licensing. Part 15

³ The Petition, at page 18, indicates that path lengths in the requested bands will range from intra-building communications to between 10-15 km or more.

operation is itself questionable under the terms of the present Communications Act; an allocation for unlicensed communications devices as proposed by Apple would be plainly impermissible. Part 15 devices have no allocation status, and have had none, internationally or domestically. If the Commission were to create a hybrid concept such as Apple's "Part 16", it would be no different. These devices are permitted on an "at-sufferance" basis: they must not cause interference to licensed radio services, and they must tolerate interference received from licensed radio services in the same bands. The Communications Act of 1934 is devoid of any authority to accord Part 15 (or Part 16) type devices any allocation status at all; the only authority to permit unlicensed devices under the Act is with respect to radio control and citizen's radio service facilities. 47 U.S.C. §307(e). The only provision for Part 15 devices in the Communications Act is for the Commission to regulate the interference potential of such devices by "reasonable regulation". 47 U.S.C. §302. This the Commission has done by permitting operation of such devices in bands allocated, on a primary basis, to one or more licensed radio services, where the operation of the unlicensed devices has been determined to be unlikely to cause interference to the licensed radio services. The benefits to the manufacturers of such non-licensed devices under the circumstances are several: their products need not be licensed before they can be used by the purchasers thereof; the equipment itself need only be authorized by the Commission by type, pursuant to Part 2 Equipment Authorization

requirements; they can operate with some degree of frequency agility and bandwidth variability; and they can be used for an infinite number of purposes, without any eligibility determinations on the part of the user. The devices can be made less expensively, and operated without regulatory effort by the owner. These benefits are at the cost of an absence of any priority in the subject bands relative to licensed radio services. The suggestion of Apple that the status of such devices should be "elevated" to a protected status would be tantamount to a change in the entire conceptual framework of regulation of unlicensed RF devices: they would be entitled to the benefits of a licensed radio service but without any of the obligations attendant to shared users in shared bands. This is inequitable in the extreme. It therefore appears, for numerous reasons, that the Apple petition is premature, and in any event is insufficient on its face to justify the initiation of rule making proceedings to effectuate a frequency allocation for the proposed new radio service.

II. The Apple Proposal Is Insufficient to Justify The Initiation of Rule Making Proceedings

3. The proposed service envisioned by Apple is a fixed and mobile service. Though the International Table of Frequency Allocations for Region 2 is rife with fixed and mobile allocations throughout the radio spectrum, the 5725-5875 MHz band is not one of them. It is indeed the policy of the United States that the 5650-5850 MHz band should not be used for fixed and mobile purposes, as a review of Footnote 803 to the Table will reveal; a number of countries desired to use the 5650-5850 MHz band for fixed and

mobile purposes, and had to create a footnote to the table in order to accommodate those desires. The United States is not one of the countries which uses the band 5650-5850 MHz for fixed and mobile purposes because it did not want those uses in the band. Thus, the proposed allocation is outside the Table of Frequency Allocations. An allocation as sought by Apple would have to be coordinated internationally, and indeed would have to be specifically coordinated with Canada and Mexico. Apple cannot simply request a use outside the International Table of Allocations. The proper method of proceeding would be to select a frequency band which is allocated internationally as well as domestically for the use proposed, or seek a change in the international table. Apple has done neither.

4. The creation of an unlicensed wireless digital radio service with unregulated access by individuals, and the allocation of spectrum for such is an innovative proposal, but it is hardly new, as is admitted in the Apple petition. The Commission has just allocated two, 10 MHz segments, one in the 2390-2400 MHz amateur band, for unlicensed Part 15 data-PCS, and has created ample allocations for new licensed and unlicensed personal communications systems, which can provide the longer-distance communications that are envisioned in the Apple petition. The "community networks" for provision of video, high-speed data and voice communications duplicate certain licensed services and those available via PCS providers in the near term. For short-range communications of the type sought by Apple, the bands above 40 GHz should be considered,

since those bands provide the wide-bandwidth, high-speed data communications envisioned in the Apple petition. Indeed, as Apple notes at page 6 of its petition, the Commission has, in Docket 94-124, proposed to allocate 8.5 GHz of spectrum for unlicensed devices above 40 GHz. Apple notes that the sufficiency of the bands above 40 GHz for high-speed unlicensed data transfer cannot yet be determined because the operating parameters, permitted power, and the like, have not yet been determined in Docket 94-124. If this is so, it is an admission that the petition is premature; the sufficiency of the two unlicensed data-PCS bands and the capabilities of the bands above 40 GHz must be explored before any further allocations for the same purpose should be considered.⁴

5. Above all, however, the 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. 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.

⁴ Apple contends that "the 20 MHz data-PCS band will not be capable of supporting the ever-higher data transfer rates required by new applications and the exponential growth in the number of users relying on those applications." (Apple petition at 13). However, this is nothing more than Apple's speculation.

6. The use of directional antennas and long-distance paths is envisioned, yet there will be no access or entry point regulation at all⁵. Despite the obvious inability to regulate, or even determine the source of interference, Apple contends that there will be compatibility with "most" current and anticipated use of the bands proposed. The petition utterly fails to explain how this will come about, or on what basis the compatibility exists. The power levels, use of directional antennas, and path lengths discussed in the Apple petition are commensurate with licensed radio services, not with unlicensed Part 15 use.

**III. The Apple Allocation Proposal Is Incompatible
With Existing and Proposed Uses**

7. Apple notes that in Europe, the 5150-5300 MHz band is used for HYPERLAN networks. The United States, however, has just completed its preparation for the 1995 World Radiocommunication Conference (WRC-95) and has specifically proposed to allot the 5150-5250 MHz band to the non-geostationary Mobile Satellite Service (MSS) feeder links. See the Report, IC Docket 94-31, FCC 95-256, released June 15, 1995. The Apple proposal for use of the 5150-5300 MHz band for protected, unlicensed data operation is inconsistent with the U.S. position going into WRC-95. The Apple

⁵ Another major concern is that the Apple petition proposes to virtually bathe users in microwave radiation. Amateurs practice prudent avoidance of exposure to microwave RF energy, but non-technical users in the type of service envisioned by Apple are not similarly educated. Nor would the type of use envisioned by Apple constitute the limited duty cycle exposure typical of amateur applications. Rather, the "NII-band" users would be exposed to high duty cycle RF, without any regulation at all by technical personnel.

petition, at 31, acknowledged the possibility of MSS feeder links in the 5150-5250 MHz segment, and merely stated that the "proposed NII band could accommodate a limited number of MSS feeder links." A "limited number", however, is not the proposal of the WRC-95 Report. The band 5150-5300 MHz is, moreover, allocated presently for Government radiolocation on a primary basis, and secondarily to other non-government services. The Apple petition is absolutely silent on the issue of compatibility with Government radiolocation uses in that band. For these reasons, it is unlikely that the 5150-5300 MHz band could be successfully implemented in the United States.

8. Apple claims that the United States' plans for development of Microwave Landing Systems at 5150-5250 MHz are on hold at present, but that even if the United States was to proceed with such, sharing issues "likely" can be resolved because European countries also propose to use MLS and the MLS/HYPERLAN sharing issues will "have to be addressed" (Apple petition, at 30). This is hardly a sufficient basis for alleging compatibility between the Apple proposal and MLS systems. The Apple petition is rife with such unsupported, vague claims. For example, Apple suggests that its "NII band" use can be compatible with MSS feeder links on a co-channel basis. At page 31 of the Petition, Apple states that "...because MSS systems will operate on a global basis, and therefore sharing between HYPERLAN systems and MSS feeder uplinks will have to be resolved in a mutually acceptable manner", Apple is "confident that an acceptable sharing scenario can be developed

within the United States".⁶ If a compatible sharing arrangement has not yet been developed, this petition is premature and must be dismissed. It is incumbent on Apple, as the petitioner, to demonstrate on the face of the petition that the proposed compatibility exists. This, it has failed utterly in this petition to do.⁷

9. The League is interested not in the 5150-5300 MHz band, however, but rather in the proposed 5725-5875 MHz portion of the proposed allocation. The Amateur Service, in Region 2, is allocated the band 5650-5925 MHz. In Regions 1 and 3, the allocation is 5650-

⁶ It is difficult to discern any reasonable basis for such optimistic theorizing on the part of Apple. CPM-95 concluded that in order for HYPERLAN to share with non-GSO MSS feeder links, feeder link stations had to be separated from indoor HYPERLANs by 3 to 10 kilometers and from outdoor HYPERLANs by 16 to 50 kilometers. It would be impossible to authorize the type of unlicensed, unregulated access service proposed by Apple in the same bands as non-GSO MSS feeder links, and insure this type of geographic separation.

⁷ The petition is rife with non-substantive cheerleading: Apple states, at page 32 of its petition, that:

With respect to radiolocation services being provided in the 5250-5300 MHz band, there is insufficient information publicly available for Apple to determine the extent to which this band is being used and the exact nature of operations in the band. However, Apple believes that the technical rules governing the NII band can be designed in a manner that will promote sharing opportunities and is hopeful that NII Band technologies could share spectrum with existing and planned users of this band.

This reveals that the 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.

5850 MHz.⁸ In the United States, the Amateur Service has an allocation in the entire band. The Amateur Service rules, at 47 C.F.R. §97.301, provide for full amateur access to the band, subject to the requirement that protection be afforded to Government (military) radiolocation⁹, and, in the 5725-5875 MHz segment, no interference can be caused to fixed-satellite service stations in Region 1. In Region 2, above 5850 MHz, the Amateur Service is co-secondary with the radiolocation service, and in the United States, secondary to the non-Government fixed satellite service. There are other limitations, and no amateur station can be protected from interference from ISM operations, Government radiolocation, or fixed-satellite operation. The Amateur-Satellite Service has an allocation at 5830-5850 MHz, in the Space-to-Earth direction only, in all three ITU Regions.

10. There is a substantial amount of amateur activity in the 5725-5875 MHz band. The League maintains no database, but is aware of significant amateur activity in the San Francisco Bay area and northern California especially, where the band is used not only for weak-signal communications, but also for repeater fixed links, point-to-point. There are at least 41 amateur stations in northern Texas regularly active in the band, and other states' VHF, UHF and microwave clubs regularly use the band. Other evidence of substantial amateur activity in the band exists, in the form of

⁸ See, 47 C.F.R. §2.106.

⁹ Of course, the Commission cannot simply allocate the band as Apple proposes; there would have to be coordination with NTIA, (as well as with Canada and Mexico) which apparently has not occurred.

microwave contest logs indicating activity in the band on a regular basis throughout the United States, principally in metropolitan areas. There are propagation beacons, and amateur stations regularly engaged in propagation research and experimentation in the band. Most notable is the emergency communications uses being made of this band by Amateurs. The band was used significantly during the Oakland Hills, California fire in 1992; amateurs had outfitted a scrap broadcast ENG truck with amateur television equipment in the 5725-5875 MHz band, which provided firefighters with invaluable video information in real time to allow coordination of the fire-fighting efforts.

11. The only statement made by Apple about compatibility of its "NII band" activity with existing uses in the 5725-5875 MHz band, including amateur uses, is on page 32 of the petition. Apple states as follows:

Operations throughout the 5725-5875 MHz band are constrained by the presence of ISM devices and the requirement that radiocommunication services using this band must accept any harmful interference caused by these devices. Because NII Band technologies generally (sic) will be a more hospitable "neighbor" than ISM devices (which currently are not subject to power limitations or emission restrictions), the NII Band allocation likely (sic) will not adversely affect existing radiolocation or Amateur operations.

This is not a confidence-inspiring interference analysis, and certainly is not sufficient to support a further proceeding based on this petition. If Apple is serious about the compatibility between its proposed use and existing radiolocation and amateur operation, it must do more than compare its proposed ubiquitous use favorably to ISM devices. ISM devices do not utilize directional

antennas, nor do they communicate over 10-15 km paths or more, nor do ISM devices generally require interference protection from other licensed services.

IV. Conclusions

12. Apple is seeking a 300 MHz allocation, but it has not justified any allocation at all. Its petition proposes frequencies outside the international table of frequency allocations internationally. The petition contains no showing why 300 MHz is necessary; why existing allocations are not sufficient for the proposed communications; why this proceeding should not await the resolution of Docket 94-124, to determine whether frequencies above 40 GHz are sufficient for the proposed high-rate data transfer; and why existing services, such as licensed and unlicensed PCS, and other wireless and wireline services are not sufficient for the allocation sought. Neither is there any compatibility showing relative to other services, existing and planned, in either 150 MHz segment sought.

13. The concept of the petition is also subject to question. Apple proposes the use of directional antennas and relatively high power, and protected allocation status in shared bands, for an unlicensed service to be used by non-technical persons, without access regulations whatsoever. The power levels and communications paths, and the use of shared bands as envisioned by Apple justifies use of licensed facilities rather than as the petition proposes.

14. In short, this Petition is not in a form which can be acted upon by the Commission. It fails to justify the relief

requested, and contains no substance at all in terms of technical justification or interference analysis. Furthermore, it is premature in light of actions proposed at WRC-95 by the Commission, and in view of the pendency of Docket 94-124. It should be dismissed forthwith by the Commission.

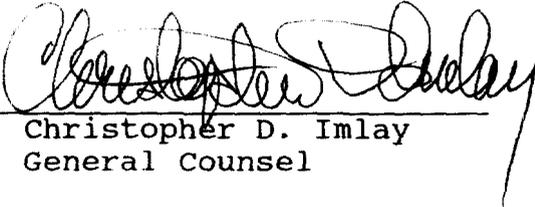
Therefore, the foregoing considered, the American Radio Relay League, Incorporated requests that the Commission take no further action toward allocation of the 5150-5300 MHz or 5725-5875 MHz bands, but rather should dismiss this petition forthwith

Respectfully submitted,

**THE AMERICAN RADIO RELAY
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CERTIFICATE OF SERVICE

I, Margaret A. Ford, Office Manager of the law firm of Booth, Freret & Imlay, do certify that copies of the foregoing COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED IN RESPONSE TO PETITION FOR RULE MAKING were mailed this 10th day of July, 1995, via U. S. Mail, postage prepaid, first class, to the offices of the following:

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