

May 14, 1998

To: The Secretary,  
Federal Communications Commission

Subject: Comments in opposition to RM-9267

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Attached are ten copies of my comments in opposition to the proposal by the Land Mobile Communications Council, per RM-9267, to re-allocate the 420-430 MHz and 440-450 MHz spectrum to shared use with private landmobile services.

I have also mailed a copy of my comments to Larry Miller of the Land Mobile Communications Council.

Sincerely,



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

In the Matter of )  
 )  
An Allocation of Spectrum for )  
Private Mobile Radio Services ) RM-9267  
 )

To: The Secretary,  
Federal Communications Commission

STATEMENT OF OPPOSITION TO RM-9267

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**2. Statement in Opposition to RM-9267**

I am writing in opposition to the Land Mobile Communications Council's proposal to re-allocate the 420-430 MHz and 440-450 MHz frequency spectrum to commercial, private, land mobile applications.

Further, instead of reallocating these bands to use by commercial private services, I ask that the

Commission change the Amateur allocation from secondary to co-primary with the U.S. government. Prior to the Cold War era, the Amateur Radio Service was a primary status user of these frequencies. With the tremendous success of the modern "no code" Technician license and the high growth of Amateur UHF operations, now is the time to restore Amateur Radio's historic primary status within the 420-450 MHz band.

I have been a licensed Amateur Radio operator for 26 years since first licensed at the age of 13. I have been involved in most all aspects of Amateur Radio including but not limited to satellite communications, HF operation, ATV, FM repeaters (including assisting in the construction of such systems), digital packet radio operation and especially in emergency communications and public service. Since 1995, I am the publisher of Ham Radio Online, the world's leading independent online web site devoted to Amateur Radio and telecommunications topics. Ham Radio Online is found on the Internet at <http://hamradio-online.com> and is currently read in 86 countries. Professionally, I have spent the last five years at an internationally respected personal computer company where I have been extensively involved in advising the company in regards to wireless communications opportunities. These opportunities include wireless data communications including short range unlicensed PC peripheral radio devices, narrowband communications options, and broadband, high speed wireless Internet access using MMDS, LMDS and 38 GHz millimeter wave technologies.

### **3. The LMCC Does Not Demonstrate a Need for the Spectrum**

Since 1995, the FCC has issued several rulings concerning "spectrum refarming". Under spectrum refarming, both private commercial and public radio users (non-commercial users like government and public safety) are given financial incentives to convert existing 30, 25 or 15 khz radio systems to narrow bandwidth technology. For example, users of 25 khz wide channels can convert to 12.5 khz, and eventually 6.25 khz wide channels; 30 khz channels can be split to 15 khz and then 7.5 khz. Once each channel is subdivided, the licensee is given permission to sublease their excess channels to others. This leasing arrangement provides licensees with a financial incentive to install more spectrum efficient radio technology.

The "spectrum refarming" proposal is described in Report & Order FCC 95-525, Memorandum Opinion & Order FCC 96-492 and 2<sup>nd</sup> Report & Order FCC 97-61.

### **3.1. The Spectrum Refarming Transition Can and Must Be Quicker Than "Decades"**

As a result of the existing spectrum refarming guidelines, land mobile is effectively doubling and then quadrupling its available frequencies, without the need for new spectrum allocations. In paragraph (31) of the LMCC proposal, they write that "...the perceived 4:1 packing density increase will not be attained for decades due to the need for a reasonable transition period for existing equipment (see Sec. III, B, *infra*)."

The assertion that this process will take "decades" is a wholly unrealistic estimate for the transition - indeed, Congress expects all consumers in the U.S. to switch to digital television receivers by 2006, in less than 8 years. Commercial radios are being replaced in less than 10 years time, and with the financial incentives under spectrum refarming, this transition could occur much more rapidly. If Congress believes that 8 years is an acceptable transition period for every television consumer in the country, than land mobile services, can certainly refarm the spectrum in a time frame much less than "decades". This is certainly the case when land mobile users have financial incentives (unlike consumers) and can increase their core business efficiency, and hence revenue, through the use of enhanced communications.

When spectrum is assigned a dollar value (as through the auction process, for commercial services and commercial applications), it is almost certainly cheaper to increase capacity through expenditures on new technology than to purchase new spectrum rights. It makes no financial or business sense for land mobile licensees to spend "decades" refarming their spectrum.

### **3.2. Spectrum Refarming May Provide Greater than a 4:1 Capacity Improvement**

In LMCC (41), the LMCC states that "Unless it is assumed that the overall communications quality level may be degraded, a 3:1 capacity increase is more likely" as a result of spectrum refarming. The analysis presented, however, is oversimplified. In fact, since spectrum refarming may result in a conversion from analog to digital (although spectrum refarming does not require a switch to digital there are many new features that make such a conversion attractive), narrowband digital technology usually tolerates higher levels of interference. For example, in narrowband TDMA digital cellular systems, frequencies can be re-used at closer cell spacings than is done in analog cellular systems. While analog technology requires a signal free of interference in order to cleanly recover the modulated voice signal, digital signaling can accommodate a worse signal to interference ratio. As long as the signal is good enough to demodulate the

digital signal, the modulated voice gets through. Therefore, to the extent that spectrum refarming is likely to be accompanied by a switch to digital modulation and signaling, the frequencies can be re-used at closer geographic distances, without causing interference. The re-use of frequencies at closer distances implies that the *overall* capacity within a region will be well above the 4:1 capacity increase created by a quadrupling of channels.

### **3.3. Capacity Increases Made Possible By Trunking**

The FCC is now permitting the use of trunking radio technology below 512 MHz. Trunking radio technology enables a further increase in total system capacity. In addition, the FCC has coalesced its historically numerous separate radio services into a small number of pools, which makes a greater number of frequencies allocated to a smaller number of radio services. This new flexibility helps improve the allocation of radio frequencies for all land mobile users. Finally, and a point the land mobile industry probably does not wish to talk about, many land mobile users have moved away from land mobile to cellular, PCS and enhanced digital SMR carriers like Nextel. A classic example is the carpenter I recently hired – he and his team are now using cellular phones instead of traditional 2-way radios. Another company representative showed me his Nextel 2-way/phone handset and mentioned that they no longer use a traditional 2-way radio system. In Section 1.5, I note that the applications proposed by the LMCC for use of the 420-430 and 440-450 MHz band are better accommodated using existing cellular and PCS services and infrastructure.

### **3.4. Future Spectrum Demand and Availability**

In the year 2006, when the television broadcast industry is required to have converted its transmissions to digital format, each station will be required to give up one of its 2 television channels (used during the conversion period). A great deal of commercial use spectrum will be freeing up, simultaneously with ever expanding deployment of other new services that already have allocated frequencies (e.g. PCS, WCS, LMDS).

It is impossible to trend recent growth curves out further than a few years. This is particularly true because *the rapid pace of change in the advancement of telecommunications technology enables ever more users to optimally use a given chunk of spectrum (for example, CDMA)*. Usage will not grow forever – as the growth curves subside and technology enables more bits per hertz, we may, in fact, be at a point

approaching an excess of spectrum, not a shortage. Last year's abysmal auction revenues of just \$13.6 million in the Wireless Communications Services (where \$1.8 BILLION was forecast), or that half of the PCS auction revenues (over \$10 billion) have been on the verge of default, are signs that Congress and the FCC have flooded the market with spectrum, literally creating a glut of spectrum. Further, most of the applications proposed by the LMCC for the 420-430 and 440-450 MHz bands will be better served by existing services. There is no need to re-allocate spectrum to the land mobile services for these applications.

### **3.5. The LMCC's Proposed Set of Applications Do Not Require Additional Spectrum**

There is not – yet – a compelling demonstration that more spectrum must be allocated away from one service and to land mobile for the purpose of providing more narrowband voice and data channels when numerous other initiatives are already underway that vastly increase the existing capacity of land mobile allocations.

In paragraph (44), the LMCC lists a set of services that are to be deployed on their requested additional spectrum. A selection of these proposed services are:

- “Mobile facsimile services for the transmission of text and images.
- Data capabilities for document processing such as customer database information, messages, files, etc.
- Data capabilities for production processes such as inventory tracking, production cycles, shipments to billing changes on customer files.
- Image transmission of still photographs such as real estate properties.
- Slow scan video transmission of images, and full motion video for coordinating activities such as heavy construction in progress.
- Telemetry devices for monitoring, signaling, or stopping and starting automated operations.
- Connection capabilities to PBX and or outside cellular systems.
- Remote interface with internal computer LAN systems, corporate intranet, and the Internet.”

Certainly there are specific examples of PMRS applications that required dedicated private radio systems. However, the bulk of operations and *especially* the applications proposed by the LMCC in the list

above, can be accommodated using existing commercial radio services – particularly those operating in the 120 MHz of spectrum allocated to Personal Communications Services (PCS), 50 MHz set aside for traditional cellular or the several megahertz set aside for narrowband PCS (paging) or Enhanced SMR providers.

2<sup>nd</sup> and 3<sup>rd</sup> generation digital cellular systems are deploying technologies to meet exactly the set of applications described by the LMCC. PCS providers have already built out or are building out a frequency efficient cellular architecture infrastructure to support extremely large numbers of users. No business or technical reason is given as to why the LMCC believes that PMRS must duplicate the existing commercial networks for *routine* business communications. Private data networks can be built on top of enhanced PCS (which may support well in excess of 128 kbps mobile telephone links on CDMA-based PCS systems within a year) using virtual private networking technology such as the L2TP or PPTP Internet protocols.

Existing cellular and PCS carriers are already building micro-cell and pico-cell coverage systems to provide flat-rate or unlimited use services to specific corporate campuses and factories using 800 MHz cellular and 1900 MHz PCS frequencies. No new spectrum allocations are needed to accommodate routine internal business communications.

#### **4. This Spectrum is Heavily Used by Amateur Radio Operations**

The LMCC has requested the immediate re-allocation of the 420-430 MHz and 440-450 MHz Amateur allocations. The 420-450 MHz UHF band is the second most used Amateur VHF/UHF band. A reallocation of the 420-450 MHz UHF band would cause severe harm to the mission of the Amateur Radio Service.

Usage of the UHF bands is expanding rapidly (almost all newly licensed Amateurs are VHF/UHF only Technician class licensees).

The UHF allocation is used extensively for public service and emergency communications. The following is a small subset of organizations that I have personally served using Amateur Radio Service frequencies in the 420-430 and 440-450 MHz band. These organizations include:

- The United States Navy
- City of Palo Alto, CA
- City of Mountain View, CA
- California Highway Patrol
- California Department of Forestry and Fire Prevention
- The U.S. Forest Service
- The U.S. Secret Service

- King County Sheriff, WA
  - King County 9-1-1
  - King County Search and Rescue
  - City of Issaquah Emergency Operations
  - Kittitas County Sheriff, WA
  - Kittitas County Search and Rescue
  - City of Ellensburg, WA
  - Seattle Marathon Association
  - Western Wheeler's Bicycling Club for the 2,200 riders of the Sequoia Century Bicycle Tour
- \* This is only a partial list representing just a few of the agencies that I have personally served during the past several years, using Amateur frequencies and technology in the 420-430 and 440-450 MHz bands.

These organizations requested emergency or public safety communications support from the Radio Amateur Civil Emergency Service or the Amateur Radio Emergency Service. The requirements imposed by these agencies were met through the use of 420-430 MHz and 440-450 MHz. In most of these applications, the unique propagation characteristics of the 420-450 MHz band proved essential to meeting the requirements. These support functions could not be relocated to the 902-928 or 1240-1300 MHz Amateur secondary allocations.

#### **4.1. Co-operative Sharing with Amateur Radio Is Not Likely to Be Satisfactory**

The history of sharing between Amateurs and commercial users is not good. In particular, Amateurs have secondary allocation status in the 902-928 MHz band. Automatic Vehicle Location services have co-primary status in this band. Some of these AVL companies have reportedly contacted all amateurs in the vicinity of their AVL systems and ordered all amateur operations suspended in the entire band. One company, in Southern California, was widely reported to have engaged in this behavior. The Company was alleged to also have contacted consumer electronics retailers and recommended that they not carry and sell Part 15 products that operated in the 902-928 MHz band.

The LMCC has proposed that Amateurs would still have access to the 420-430 and 440-450 bands but would be relegated to secondary status behind the PMRS's primary status. No mechanism is proposed for how such sharing would be done. In fact, it is likely to be like that at 902-928 MHz where AVL operators have allegedly told Amateurs to shut down their equipment. *This is not sharing.*

Sharing works between entities that do not have economic incentives tied to their operations – for example, the use of NOAA doppler radar at 448-450 MHz, shared with the Amateur radio services. Neither party is in the business of “making money” from use of the spectrum, but is instead focused on activities

including promoting the public safety. Further, the Amateur Radio Service provides valuable Skywarn volunteer services to NOAA so such sharing of spectrum is mutually beneficial. Similarly, the UHF allocation is also used by the U.S. military for PAVE PAWS radar and other functions. Again, Amateurs have a long and proud history of supporting the U.S. military, from volunteering for communication service in times of war, such as tactical support of the Gulf War in Kuwait, and at domestic military events such as military air shows. Amateurs and the military have a mutual interest in cooperative sharing of these frequencies.

*Sharing between mutually incompatible services will not work. Land mobile has no mutual interests with the Amateur Radio service. Private land mobile makes money (indirectly by virtue of running business that use radio frequencies) off of the frequencies that they use. They have significant incentives to eliminate Amateur Radio operations in the 420-430 and 440-450 MHz bands. Amateurs can and will continue to share their VHF and UHF spectrum allocations with mutually compatible services but sharing with land mobile will not work due to incompatible goals between the services.*

#### **4.2. Who Bears The Costs of Relocating Amateur Operations At 420-450 MHz?**

Huge amounts of Amateur telecommunications equipment are currently in use in both 420-430 and 440-450 MHz. The 430-440 MHz segment is not capable of supporting all the operations currently underway in the 420-430 and 440-450 MHz bands. Existing functions in the 430-440 MHz and can not also accommodate the relocation of existing Amateur voice and data applications, nor wide band applications in 430-440 Mhz. Existing Amateur operations will either cease to exist, or perhaps eventually and at enormous personal cost, could be relocated to other Amateur frequencies.

The availability of other Amateur radio frequencies is seriously in doubt, however. First, for wide band operations, there is no band with comparable propagation characteristics. This could greatly hinder applications such as ATV, experimental digital ATV, and broadband data networks. Unlike commercial users with paying customers, Amateurs must necessarily build communications networks with the minimum amount of physical infrastructure – the use of higher UHF frequencies for comparable applications would be prohibitively expensive. This is partially why Amateurs historically make more active use of low UHF versus high UHF frequencies, initially.

Many higher UHF frequencies may not be available for the kinds of Amateur applications now in use at 420-450 MHz. Specifically, Part 15 and automatic vehicle location systems, have resulted in either the de facto (Part 15) or actual (AVL) prohibition of Amateur operations in the 902-928 MHz band. A proposal is currently under consideration to reallocate a significant part of the shared Amateur band at 1240-1300 MHz to GPS II. Finally, Part 15 use in the 2.4 Ghz band will grow rapidly with the advent of wireless home computer networking applications (see the work of the industry-wide Home RF Working Group, for example); and the Landmobile industry has itself suggested that it would like to see 2.4-2.45 GHz opened to commercial services.

It may be tempting to paint an analogy of the re-allocation of the Amateur 220-222 MHz band to the private landmobile service. However, the 220-225 MHz band, ten years ago, had vastly fewer users than does the 420-450 MHz band today. Second, the ARRL's 220-225 MHz band plan had split the band in to two nearly identical band plans – encompassing 220-222 and 223-225 MHz. The result was that in the then less congested band, space was approximately available to relocate existing 220-222 MHz users to 223-225 MHz. The same is definitely not true in the case of 420-450 MHz. This is the second most heavily used Amateur VHF/UHF band. The entire band is allocated in ways that it is simply not possible to relocate 20 MHz of applications into 10 MHz of spectrum that is already in use. *In fact, the LMCC tries to argue that spectrum refarming won't achieve significant capacity increases for commercial users, but then turns around and suggests that Amateurs can magically achieve a greater than 3:1 reduction by compressing 30 MHz of existing operations into a single 10 MHz allocation.*

The cost of Amateur's de facto losing access to this band would easily be in the tens of millions of dollars. By law, Amateurs are prohibited from collecting reimbursement for Amateur operations. Unlike the commercial and public safety/government sector, there are no financial incentives (e.g. sub leasing of channels freed up by spectrum refarming) for Amateurs. The de facto loss of a band is an onerous tax on Amateur Radio operators who are stuck with investments in unusable radio gear -mobile radios, handheld radios, repeaters, portable repeaters, packet radio equipment, packet radio digipeaters, Amateur Television transmitters, Amateur Television repeaters, broadband digital data equipment. Tens of millions of dollars of voluntary investments in the public's emergency communications infrastructure would be thrown out.

In some cases, but at considerable expense, Amateur operations could be relocated to other frequencies. However, due to different propagation characteristics of say, 1.2 GHz, frequencies, multiple 1.2 GHz repeaters would be required to cover an area now served by a single 440 MHz repeater. The total costs of this proposed change to the Amateur Radio Service, borne by individual radio users, could potentially reach hundreds of millions of dollars. Since individual Amateur Radio operators cannot personally afford this change over, this proposed change would likely result in the end of much of the public service and emergency communications worked noted, by example, in Section 2 of my comments. Further, on going experimentation in a variety of communications technologies at 420-450 MHz would cease to exist.

## 5. Summary

The LMCC proposal:

- Does not provide a justification for the need for these Amateur Radio frequencies, particularly with regard to existing initiatives that are vastly increasing the number of land mobile channels
- Recent spectrum auctions have not earned anywhere near the returns that were originally forecast, suggesting that the market for spectrum is, in fact, more than satisfied at this time.
- The LMCC initiative suggests that commercial and Amateur uses could share the same frequencies, yet fails to suggest any method of how such sharing would work or how conflicts would be resolved. There is no pooling of mutual interests between the goals of land mobile and the goals of the Amateur Radio Service. Based on the history of "sharing" with AVL users in the 902-928 MHz band, "sharing" means that commercial users will force Amateurs off of the band. Overall, commercial and non-commercial (Amateur) band sharing does not work well. Sharing between non-commercial (government) and non-commercial (Amateur) has been far more successful. Amateurs can and will continue to share their VHF and UHF allocations with mutually compatible radio services – but landmobile is not one of these services.
- The LMCC proposal would drastically eliminate most of the second most used Amateur Radio Service allocation at VHF and UHF
- The LMCC argues in one breath that the quadrupling of frequencies made possible by spectrum refarming will not actually happen and that the expected capacity increases will not occur. But then,

the LMCC magically suggests that 30 MHz of Amateur allocations can be fit into a 10 MHz bandwidth. The LMCC can not both argue that spectrum efficiencies work for Amateurs but do not work effectively for land mobile – they simply cannot have this both ways. They also fail to note that the commercial parties have financial incentives to increase capacity through spectrum refarming, while Amateur radio operators must bear the burden of all costs with no reimbursement.

- The proposal would result in the loss of potentially hundreds of millions of dollars of communications infrastructure that is provided at no charge to local, regional, state and federal governments during times of needs, and to local community groups for public safety events. To understand the impact of this, consider that Amateur Radio was the only link from a tiny Hawaiian island after being slammed by Hurricane Iniki; think of the critical communications and volunteers that would not have been available at the 1989 Loma Prieta Earthquake, the Big Bear Quake, the Northridge Quake, in flood ravaged Grand Forks, North Dakota or Hurricane Andrew devastated Florida, and thousands of other local and regional disaster situations.
- Realistically, most existing Amateur operations could not be relocated due to the large personal expense and technical issues, like differences in propagation characteristics, at higher UHF frequencies. The result would be devastation to one of the core missions for the Amateur Radio Service and to the communities we serve.

I respectfully request that the Commission DENY the LMCC request to immediately re-allocate the Amateur 420-430 and 440-450 MHz allocations to private land mobile applications. Instead, I respectfully request that the Commission restore Amateur Radio's primary status to the entire 420-450 MHz band.

Sincerely,



Edward Mitchell, KF7VY  
25659 SE 154<sup>th</sup> St  
Issaquah, WA 98027  
May 13, 1998

**CERTIFICATE OF SERVICE:**

The Commission has assigned this petition file number RM-9267 and established a preliminary comment period. The public comment period ends on June 1, 1998. Therefore these comments are timely filed.

On May 14, I mailed this document (described as a Statement of Opposition to RM-9267) to Larry Miller, Land Mobile Communications Council, 1110 North Glebe Road, Suite 500, Arlington, Virginia 22201-5720 as required by Section §1.47 and §1.405 of the Commission's Rules (47 C.F.R. §1.47, 47 C.F.R. §1.405)

  
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Edward Mitchell, KF7VY

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In the year 2006, when the television broadcast industry is required to have converted its transmissions to digital format, each station will be required to give up one of its 2 television channels (used during the conversion period). A great deal of commercial use spectrum will be freeing up, simultaneously with ever expanding deployment of other new services that already have allocated frequencies (e.g. PCS, WCS, LMDS).

It is impossible to trend recent growth curves out further than a few years. This is particularly true because *the rapid pace of change in the advancement of telecommunications technology enables ever more users to optimally use a given chunk of spectrum (for example, CDMA)*. Usage will not grow forever – as the growth curves subside and technology enables more bits per hertz, we may, in fact, be at a point

approaching an excess of spectrum, not a shortage. Last year's abysmal auction revenues of just \$13.6 million in the Wireless Communications Services (where \$1.8 BILLION was forecast), or that half of the PCS auction revenues (over \$10 billion) have been on the verge of default, are signs that Congress and the FCC have flooded the market with spectrum, literally creating a glut of spectrum. Further, most of the applications proposed by the LMCC for the 420-430 and 440-450 MHz bands will be better served by existing services. There is no need to re-allocate spectrum to the land mobile services for these applications.

### **3.5. The LMCC's Proposed Set of Applications Do Not Require Additional Spectrum**

There is not – yet – a compelling demonstration that more spectrum must be allocated away from one service and to land mobile for the purpose of providing more narrowband voice and data channels when numerous other initiatives are already underway that vastly increase the existing capacity of land mobile allocations.

In paragraph (44), the LMCC lists a set of services that are to be deployed on their requested additional spectrum. A selection of these proposed services are:

- “Mobile facsimile services for the transmission of text and images.
- Data capabilities for document processing such as customer database information, messages, files, etc.
- Data capabilities for production processes such as inventory tracking, production cycles, shipments to billing changes on customer files.
- Image transmission of still photographs such as real estate properties.
- Slow scan video transmission of images, and full motion video for coordinating activities such as heavy construction in progress.
- Telemetry devices for monitoring, signaling, or stopping and starting automated operations.
- Connection capabilities to PBX and or outside cellular systems.
- Remote interface with internal computer LAN systems, corporate intranet, and the Internet.”

Certainly there are specific examples of PMRS applications that required dedicated private radio systems. However, the bulk of operations and *especially* the applications proposed by the LMCC in the list

above, can be accommodated using existing commercial radio services – particularly those operating in the 120 MHz of spectrum allocated to Personal Communications Services (PCS), 50 MHz set aside for traditional cellular or the several megahertz set aside for narrowband PCS (paging) or Enhanced SMR providers.

2<sup>nd</sup> and 3<sup>rd</sup> generation digital cellular systems are deploying technologies to meet exactly the set of applications described by the LMCC. PCS providers have already built out or are building out a frequency efficient cellular architecture infrastructure to support extremely large numbers of users. No business or technical reason is given as to why the LMCC believes that PMRS must duplicate the existing commercial networks for *routine* business communications. Private data networks can be built on top of enhanced PCS (which may support well in excess of 128 kbps mobile telephone links on CDMA-based PCS systems within a year) using virtual private networking technology such as the L2TP or PPTP Internet protocols.

Existing cellular and PCS carriers are already building micro-cell and pico-cell coverage systems to provide flat-rate or unlimited use services to specific corporate campuses and factories using 800 MHz cellular and 1900 MHz PCS frequencies. No new spectrum allocations are needed to accommodate routine internal business communications.

#### **4. This Spectrum is Heavily Used by Amateur Radio Operations**

The LMCC has requested the immediate re-allocation of the 420-430 MHz and 440-450 MHz Amateur allocations. The 420-450 MHz UHF band is the second most used Amateur VHF/UHF band. A reallocation of the 420-450 MHz UHF band would cause severe harm to the mission of the Amateur Radio Service.

Usage of the UHF bands is expanding rapidly (almost all newly licensed Amateurs are VHF/UHF only Technician class licensees).

The UHF allocation is used extensively for public service and emergency communications. The following is a small subset of organizations that I have personally served using Amateur Radio Service frequencies in the 420-430 and 440-450 MHz band. These organizations include:

- The United States Navy
- City of Palo Alto, CA
- City of Mountain View, CA
- California Highway Patrol
- California Department of Forestry and Fire Prevention
- The U.S. Forest Service
- The U.S. Secret Service

- King County Sheriff, WA
  - King County 9-1-1
  - King County Search and Rescue
  - City of Issaquah Emergency Operations
  - Kittitas County Sheriff, WA
  - Kittitas County Search and Rescue
  - City of Ellensburg, WA
  - Seattle Marathon Association
  - Western Wheeler's Bicycling Club for the 2,200 riders of the Sequoia Century Bicycle Tour
- \* This is only a partial list representing just a few of the agencies that I have personally served during the past several years, using Amateur frequencies and technology in the 420-430 and 440-450 MHz bands.

These organizations requested emergency or public safety communications support from the Radio Amateur Civil Emergency Service or the Amateur Radio Emergency Service. The requirements imposed by these agencies were met through the use of 420-430 MHz and 440-450 MHz. In most of these applications, the unique propagation characteristics of the 420-450 MHz band proved essential to meeting the requirements. These support functions could not be relocated to the 902-928 or 1240-1300 MHz Amateur secondary allocations.

#### ***4.1. Co-operative Sharing with Amateur Radio Is Not Likely to Be Satisfactory***

The history of sharing between Amateurs and commercial users is not good. In particular, Amateurs have secondary allocation status in the 902-928 MHz band. Automatic Vehicle Location services have co-primary status in this band. Some of these AVL companies have reportedly contacted all amateurs in the vicinity of their AVL systems and ordered all amateur operations suspended in the entire band. One company, in Southern California, was widely reported to have engaged in this behavior. The Company was alleged to also have contacted consumer electronics retailers and recommended that they not carry and sell Part 15 products that operated in the 902-928 MHz band.

The LMCC has proposed that Amateurs would still have access to the 420-430 and 440-450 bands but would be relegated to secondary status behind the PMRS's primary status. No mechanism is proposed for how such sharing would be done. In fact, it is likely to be like that at 902-928 MHz where AVL operators have allegedly told Amateurs to shut down their equipment. *This is not sharing.*

Sharing works between entities that do not have economic incentives tied to their operations – for example, the use of NOAA doppler radar at 448-450 MHz, shared with the Amateur radio services. Neither party is in the business of “making money” from use of the spectrum, but is instead focused on activities

including promoting the public safety. Further, the Amateur Radio Service provides valuable Skywarn volunteer services to NOAA so such sharing of spectrum is mutually beneficial. Similarly, the UHF allocation is also used by the U.S. military for PAVE PAWS radar and other functions. Again, Amateurs have a long and proud history of supporting the U.S. military, from volunteering for communication service in times of war, such as tactical support of the Gulf War in Kuwait, and at domestic military events such as military air shows. Amateurs and the military have a mutual interest in cooperative sharing of these frequencies.

*Sharing between mutually incompatible services will not work. Land mobile has no mutual interests with the Amateur Radio service. Private land mobile makes money (indirectly by virtue of running business that use radio frequencies) off of the frequencies that they use. They have significant incentives to eliminate Amateur Radio operations in the 420-430 and 440-450 MHz bands. Amateurs can and will continue to share their VHF and UHF spectrum allocations with mutually compatible services but sharing with land mobile will not work due to incompatible goals between the services.*

#### **4.2. Who Bears The Costs of Relocating Amateur Operations At 420-450 MHz?**

Huge amounts of Amateur telecommunications equipment are currently in use in both 420-430 and 440-450 MHz. The 430-440 MHz segment is not capable of supporting all the operations currently underway in the 420-430 and 440-450 MHz bands. Existing functions in the 430-440 MHz and can not also accommodate the relocation of existing Amateur voice and data applications, nor wide band applications in 430-440 Mhz. Existing Amateur operations will either cease to exist, or perhaps eventually and at enormous personal cost, could be relocated to other Amateur frequencies.

The availability of other Amateur radio frequencies is seriously in doubt, however. First, for wide band operations, there is no band with comparable propagation characteristics. This could greatly hinder applications such as ATV, experimental digital ATV, and broadband data networks. Unlike commercial users with paying customers, Amateurs must necessarily build communications networks with the minimum amount of physical infrastructure – the use of higher UHF frequencies for comparable applications would be prohibitively expensive. This is partially why Amateurs historically make more active use of low UHF versus high UHF frequencies, initially

Many higher UHF frequencies may not be available for the kinds of Amateur applications now in use at 420-450 MHz. Specifically, Part 15 and automatic vehicle location systems, have resulted in either the de facto (Part 15) or actual (AVL) prohibition of Amateur operations in the 902-928 MHz band. A proposal is currently under consideration to reallocate a significant part of the shared Amateur band at 1240-1300 MHz to GPS II. Finally, Part 15 use in the 2.4 Ghz band will grow rapidly with the advent of wireless home computer networking applications (see the work of the industry-wide Home RF Working Group, for example); and the Landmobile industry has itself suggested that it would like to see 2.4-2.45 GHz opened to commercial services.

It may be tempting to paint an analogy of the re-allocation of the Amateur 220-222 MHz band to the private landmobile service. However, the 220-225 MHz band, ten years ago, had vastly fewer users than does the 420-450 MHz band today. Second, the ARRL's 220-225 MHz band plan had split the band in to two nearly identical band plans – encompassing 220-222 and 223-225 MHz. The result was that in the then less congested band, space was approximately available to relocate existing 220-222 MHz users to 223-225 MHz. The same is definitely not true in the case of 420-450 MHz. This is the second most heavily used Amateur VHF/UHF band. The entire band is allocated in ways that it is simply not possible to relocate 20 MHz of applications into 10 MHz of spectrum that is already in use. *In fact, the LMCC tries to argue that spectrum refarming won't achieve significant capacity increases for commercial users, but then turns around and suggests that Amateurs can magically achieve a greater than 3:1 reduction by compressing 30 MHz of existing operations into a single 10 MHz allocation.*

The cost of Amateur's de facto losing access to this band would easily be in the tens of millions of dollars. By law, Amateurs are prohibited from collecting reimbursement for Amateur operations. Unlike the commercial and public safety/government sector, there are no financial incentives (e.g. sub leasing of channels freed up by spectrum refarming) for Amateurs. The de facto loss of a band is an onerous tax on Amateur Radio operators who are stuck with investments in unusable radio gear -mobile radios, handheld radios, repeaters, portable repeaters, packet radio equipment, packet radio digipeaters, Amateur Television transmitters, Amateur Television repeaters, broadband digital data equipment. Tens of millions of dollars of voluntary investments in the public's emergency communications infrastructure would be thrown out.

In some cases, but at considerable expense. Amateur operations could be relocated to other frequencies. However, due to different propagation characteristics of say, 1.2 GHz, frequencies, multiple 1.2 GHz repeaters would be required to cover an area now served by a single 440 MHz repeater. The total costs of this proposed change to the Amateur Radio Service, borne by individual radio users, could potentially reach hundreds of millions of dollars. Since individual Amateur Radio operators cannot personally afford this change over, this proposed change would likely result in the end of much of the public service and emergency communications worked noted, by example, in Section 2 of my comments. Further, on going experimentation in a variety of communications technologies at 420-450 MHz would cease to exist.

## 5. Summary

The LMCC proposal:

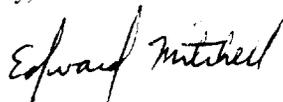
- Does not provide a justification for the need for these Amateur Radio frequencies, particularly with regard to existing initiatives that are vastly increasing the number of land mobile channels
- Recent spectrum auctions have not earned anywhere near the returns that were originally forecast, suggesting that the market for spectrum is, in fact, more than satisfied at this time.
- The LMCC initiative suggests that commercial and Amateur uses could share the same frequencies, yet fails to suggest any method of how such sharing would work or how conflicts would be resolved. There is no pooling of mutual interests between the goals of land mobile and the goals of the Amateur Radio Service. Based on the history of "sharing" with AVL users in the 902-928 MHz band, "sharing" means that commercial users will force Amateurs off of the band. Overall, commercial and non-commercial (Amateur) band sharing does not work well. Sharing between non-commercial (government) and non-commercial (Amateur) has been far more successful. Amateurs can and will continue to share their VHF and UHF allocations with mutually compatible radio services – but *landmobile is not one of these services.*
- The LMCC proposal would drastically eliminate most of the second most used Amateur Radio Service allocation at VHF and UHF
- The LMCC argues in one breath that the quadrupling of frequencies made possible by spectrum refarming will not actually happen and that the expected capacity increases will not occur. But then,

the LMCC magically suggests that 30 MHz of Amateur allocations can be fit into a 10 MHz bandwidth. The LMCC can not both argue that spectrum efficiencies work for Amateurs but do not work effectively for land mobile – they simply cannot have this both ways. They also fail to note that the commercial parties have financial incentives to increase capacity through spectrum refarming, while Amateur radio operators must bear the burden of all costs with no reimbursement.

- The proposal would result in the loss of potentially hundreds of millions of dollars of communications infrastructure that is provided at no charge to local, regional, state and federal governments during times of needs, and to local community groups for public safety events. To understand the impact of this, consider that Amateur Radio was the only link from a tiny Hawaiian island after being slammed by Hurricane Iniki; think of the critical communications and volunteers that would not have been available at the 1989 Loma Prieta Earthquake, the Big Bear Quake, the Northridge Quake, in flood ravaged Grand Forks, North Dakota or Hurricane Andrew devastated Florida, and thousands of other local and regional disaster situations.
- Realistically, most existing Amateur operations could not be relocated due to the large personal expense and technical issues, like differences in propagation characteristics, at higher UHF frequencies. The result would be devastation to one of the core missions for the Amateur Radio Service and to the communities we serve.

I respectfully request that the Commission DENY the LMCC request to immediately re-allocate the Amateur 420-430 and 440-450 MHz allocations to private land mobile applications. Instead, I respectfully request that the Commission restore Amateur Radio's primary status to the entire 420-450 MHz band.

Sincerely,



Edward Mitchell, KF7VY  
25659 SE 154<sup>th</sup> St  
Issaquah, WA 98027  
May 13, 1998

**CERTIFICATE OF SERVICE:**

The Commission has assigned this petition file number RM-9267 and established a preliminary comment period. The public comment period ends on June 1, 1998. Therefore these comments are timely filed.

On May 14, I mailed this document (described as a Statement of Opposition to RM-9267) to Larry Miller, Land Mobile Communications Council, 1110 North Glebe Road, Suite 500, Arlington, Virginia 22201-5720 as required by Section §1.47 and §1.405 of the Commission's Rules (47 C.F.R. §1.47, 47 C.F.R. §1.405)

  
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Edward Mitchell, KF7VY