

ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)

CITY OF LOS ANGELES)

Application for Airborne Microwave)
Downlink Video Experimental License)

File No. 0247-EX-PL-1999
Call Sign WB2XEN

To: The Chief,
Office of Engineering and Technology

RECEIVED

DEC 8 1999

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

PETITION FOR RECONSIDERATION

THE AMERICAN RADIO RELAY
LEAGUE, INCORPORATED
225 Main Street
Newington, Connecticut 06111

BOOTH FRERET IMLAY & TEPPER, P.C.
5101 Wisconsin Avenue, NW
Suite 307
Washington, DC 20016-4120
(202) 686-9600

December 8, 1999

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SUMMARY

The American Radio Relay League, Incorporated (the League), for itself and on behalf of its members in the vicinity of Los Angeles, California, requests that the Commission reconsider and reverse the December 1, 1999 action of the Experimental Licensing Branch, New Technology Division, Office of Engineering and Technology, granting the September 8, 1999 application for an airborne microwave downlink video experimental license, filed by the City of Los Angeles (the City) on FCC Form 442. The application seeks authority to install and operate a microwave downlink system for airborne public safety video transmissions at 2402-2448 MHz, comprising a four-channel system of helicopter transmitters. This system cannot operate without causing destructive, preclusive interference to existing, licensed, and operational amateur radio facilities in the Los Angeles area and elsewhere.

Furthermore, this application seeks facilities identical to those requested in a similar application filed by the County of Los Angeles, (Experimental Application file number 0217-EX-PL-1999) seeking Commission authority to implement an elaborate system of airborne video transmitters in the 2402-2448 MHz band, which is subject to substantial opposition, and which has not been adjudicated.

Neither the League, nor other radio amateurs in the Los Angeles area had any prior notice of this defective application, and had no opportunity heretofore to address the interference potential of it. Therefore, the League respectfully requests that the grant, which never should have been made in the first place, and in any case not prior to action on the County of Los Angeles application, be rescinded immediately.

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To: The Chief,
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PETITION FOR RECONSIDERATION

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 1.106 of the Commission's Rules,¹ for itself and on behalf of its members in the vicinity of Los Angeles, California, hereby respectfully requests that the Commission reconsider and reverse the action of December 1, 1999 of the Experimental Licensing Branch, New Technology Division, Office of Engineering and Technology, granting the September 8, 1999 application for an airborne microwave downlink video experimental license, filed by the City of Los Angeles (the City) on

¹ The League has inquired of Commission staff whether a Petition for Reconsideration filed pursuant to Section 1.106 of the Commission's Rules is the proper procedural vehicle for seeking rescission of an experimental application post-grant. Undersigned counsel was advised that such a petition was proper pursuant to Section 1.106(b)(1), and believes that to be correct. If, however, for any reason, a Section 1.106 Petition for Reconsideration is inapplicable to experimental authorization grants, the League respectfully requests that this Petition be considered a request for rescission of the grant, pursuant to Section 1.1 or Section 1.41 of the Commission's procedural rules.

FCC Form 442. The application seeks authority to install and operate a microwave downlink system for airborne public safety video transmissions at 2402-2448 MHz, comprising a four-channel system of helicopter transmitters. Because this system cannot operate without causing destructive, preclusive interference to existing, licensed, and operational amateur radio facilities in the Los Angeles area and elsewhere, the League respectfully requests that the grant be rescinded immediately. As good cause therefor, the League states as follows:

1. The League received notice in September, 1999 of the filing on August 9, 1999 by the **County** of Los Angeles of an Experimental Application (file number 0217-EX-PL-1999) seeking Commission authority to implement an elaborate system of airborne video transmitters in the 2402-2448 MHz band. That application alleged that it was being filed for the purpose of studying interference potential to incumbent users, preparatory apparently to an allocation proposal to establish a public safety video service in the band. The application included a monitoring study, ostensibly to establish what was described as the "underutilization" of the band 2402-2448 MHz. On September 23, 1999, the League filed an *Informal Objection* to that application. Other parties filed similar objections, due to the inevitable interference that would be caused from the proposed operation to incumbent amateur radio facilities, including amateur television repeaters located atop mountains in the Los Angeles area and amateur satellite operations.² The County of Los Angeles has since filed two Motions for Extensions of Time to respond to those Informal Objections (but has not filed any responsive pleading), and the application remains pending.

² See, e.g. the *Informal Objection of the Amateur Television Network*, filed October 21, 1999; Letter of Thomas R. O'Hara dated October 22, 1999; the Letter of Art McBride dated October 20, 1999; and the Letter of AMSAT, the Radio Amateur Satellite Corporation, dated October 22, 1999.

2. The City's application is virtually identical to that of the County, except that it contains no monitoring study and no effort to demonstrate that the experimental operation could be conducted without causing severe interference to amateur operation at 2402-2448 MHz. The League only recently discovered that this application was pending, because no public notice is given of experimental authorizations until long after they are granted. Yet, despite the fact that the City's application proposes facilities identical to those sought by the County; despite the substantial opposition to the County's application, which has not been acted upon, and despite the actual knowledge of the Experimental Licensing Branch of the opposition by amateur radio operators to the County's proposal, the Experimental Licensing Branch has inexplicably granted the City's application for the *exact same facilities at the exact same location*. This is the first occasion that the League has had to oppose this application, and submits that it never should have been granted in the first place. As will be shown, the application was flawed in its premises, contains material misrepresentations of fact, and proposes operation that is fundamentally incompatible with incumbent amateur radio licensed operation in accordance with the Part 2 Table of Allocations.

3. The City claims a need for experimental authorization to develop a video transmission system in the Los Angeles area for public safety purposes. There is nothing experimental about this proposal. It merely proposes the use of commercially available video transmitting equipment used by broadcasters and by public safety entities in the 2450-2483.5 MHz band (which is available for public safety video pursuant to existing Part 90 rules) to establish an expanded public safety video system with numerous channels. There is nothing about this proposal that requires an experimental license whatsoever. The City can do all of its experiments in the 2450-

2483.5 MHz band pursuant to existing license eligibility. In fact, the City of Los Angeles is a participant in a Declaratory Ruling, filed September 1, 1999 together with other municipal entities, asking the Mass Media and Wireless Telecommunications Bureaus to establish a priority for public safety video at 2450-2483.5 MHz over the broadcast auxiliary users of that band. In that document, the City admits it has authorization to conduct operations identical to those it proposes to conduct on an experimental basis at 2402-2448 MHz.

4. The other claim of the City is that it will construct and operate this system in order to demonstrate non-interference to existing users, preparatory to a permanent allocation proposal. The City proposes video downlinks from *twelve police department helicopters and three fire department helicopters* from RF cameras to one remote receive site with active tracking antennas, and then transmitted by terrestrial facilities to the served agencies. Mobile command units will also be able to receive the video directly from the helicopters at itinerant locations. The application states that, for the development of this elaborate and expensive system, the City has identified the spectrum at 2402-2448 MHz as "underutilized." It offers *absolutely no justification for this allegation*, however. It claims that it has conducted "extensive monitoring and data collection of this spectrum" (apparently referring to 2402-2448 MHz) in order to confirm that the band is "underutilized." However, the Commission must be willing to accept on faith that that the monitoring and data collection actually occurred, and that the methodology and conclusions (whatever they were) were accurate. The League suggests that the Commission should never have taken the representation of the City on faith, especially since the *County* of Los Angeles, with its experimental application, submitted a hopelessly flawed monitoring study which proved nothing whatsoever. There is no compatibility showing included with the City's

application, and there is no basis for the City's claim that interference from this system will not be suffered by incumbent users.

5. The League would suggest that the City has failed to justify the grant of an experimental authorization, especially one of this magnitude. Furthermore, it is readily apparent that the City's proposed downlink system will operate on an unpredictable, itinerant airborne basis, without any possibility of coordination with existing users, and thus without any ability to operate on a non-interference basis. Section 5.67(a) of the Commission's Rules states that "(n)ormally, not more than one frequency in a band of frequencies will be assigned for the use of a single applicant unless a showing is made demonstrating that need for the assignment of additional frequencies is essential to the proposed program of experimentation." Furthermore, Section 5.67(b) states that "(f)requency assignments will be made only on the condition that harmful interference will not be caused to any station operating in accordance with the Table of Frequency Allocation (sic) of part 2 of this chapter." It is submitted that the City cannot satisfy either of these conditions under its existing plan, and the Authorization as issued on December 1, 1999 contains no reference to the non-interference obligation of the City and not even a frequency coordination requirement relative to amateur users.

6. The City's proposed experimental authorization is an effort merely to expand its existing Part 90 allocation without rulemaking. There is no necessary course of experimentation which could not be conducted pursuant to existing Part 90 service rules, and in any case none that would require construction of the entire proposed system at once. Interference studies, if that was in reality the goal of the City, could be conducted by calculations based on standard reference circuits, and the amount of amateur television, and television repeater and auxiliary

operation in the 2402-2448 MHz band clearly precludes any airborne video downlinks in that band. Neither interference nor feasibility studies could possibly require the construction of the entire system, with fixed and mobile receive sites, tracking antennas, GPS-based location systems, and terrestrial relay systems. Instead, it is obvious from the experimental proposal that the City wishes to construct the entire system and then simply stay there. The Commission should not have granted any portion of this application, but at most, it should not have authorized more than a single, 10 MHz video channel in this band, and a single transmitter aboard a single helicopter, to allow the alleged interference and feasibility studies to be conducted, in accord with Section 5.67(a) of the Rules. Section 5.68 of the Rules states that an applicant for a station in the Experimental Radio Services "accepts the license with the express understanding" that, among other things, "the authority to use the frequency or frequencies assigned is granted upon an experimental basis only and does not confer any right to conduct an activity of a continuing nature". To permit the City to install a comprehensive, wide-area video downlinking system on the justification provided would be tantamount to allowing the permanent construction of a facility for which there is no public safety Part 90 allocation, but which would be operated on a continuing basis.

7. The major problem with this proposal, however, is that there is absolutely no demonstration of the ability of this system to operate without causing harmful interference to, at least, amateur service operations at 2400-2450 MHz. Whether or not the band is "underutilized" is an issue for an allocation proceeding, and is irrelevant to whether or not interference is going to be caused to incumbent licensees in the band at issue. The City has not suggested, and could not attempt to suggest, that there are no incumbent users, and hence, the

claim of underutilization is not relevant to whether or not an experimental authorization should be granted. In fact, the band is not underutilized by amateurs in Los Angeles; it is substantially used, as can be seen from the Oppositions to the County application. As noted in the opposition of Thomas R. O'Hara to the County application:

There simply are no amateur radio frequencies available in the geographical area they wish to cover that are not already coordinated to amateurs for mountain top repeaters and auxiliary links. I have discussed this with some of the local public safety agencies...There are three high ATV repeater sites all above 5,000 feet overlooking the Los Angeles County area that have a coordinated input on 2441.5 MHz that would key up and repeat the video out on the 33 or 23 cm Amateur bands if Los Angeles County transmitted on the 2426 to 2436 or 2438 to 2448 MHz channels they have asked for. The coordinated channel is 17 MHz wide and 4 MHz deviation is used. More ATV repeater inputs on this band are planned.

In addition, there are 7 high ATV repeater sites, one of which is on a same mountain top as they wish to use, that use 2417.5 MHz for automatically controlled auxiliary video linking. If Los Angeles County came on the proposed 2414 to 2424 MHz or 2402 to 2412 Mhz channels, there is a high probability that they would get into the link receivers and would again result in the unwanted video interfering or being repeated out over many ATV repeaters. Some of these Amateur Radio links could get into Los Angeles County's receivers also.

8. The Amateur Service was afforded a primary domestic allocation in the 2402-2417 MHz band in Docket 94-32, by the *First Report and Order and Second Notice of Proposed Rule Making*, FCC 95-47, released February 17, 1995. The Commission stated in that Order, in relevant part, as follows:

As described above, this band lies within 2400-2483.5 MHz, which is available for use by spread spectrum devices under Part 15 of our rules. Eliminating Part 15 use of 2402-2417 MHz would severely reduce the amount of spectrum available to Part 15 devices, and could significantly impair the ability of Part 15 devices to operate in the 2400-2483.5 MHz band by forcing them to operate entirely in portions of the band most affected by ISM devices and by limiting their information capacity. These Part 15 devices provide a variety of consumer and business oriented services that benefit individuals, commercial services, and

private spectrum users, and they also have applications for public safety and medical needs. Benefits include lower costs of energy through automatic meter reading and optimized power generation, low-cost broadband access to internet services and other information networks for schools, libraries, telecommuters and home offices, mobility of telephonic and computer communications within offices and homes without extensive reconstruction and wiring, immediately installable video conferencing among and between buildings for educational instruction, health care monitoring and judicial procedures without construction of special studio facilities, safe transport of chemicals and petroleum products...and control for potentially tens of thousands of traffic lights, at less than one-third the cost of wireline solutions, to ease road congestion, and significantly reduce pollution and new street construction...

One of the principal Part 15 uses being implemented in the 2400-2483.5 MHz band is wireless LANs. Commenters have provided sales figures demonstrating a rapidly expanding market for wireless LAN equipment...Disrupting Part 15 use of 2402-2417 MHz could affect the market as well as the ability of U.S. firms to compete in the worldwide market for wireless LANs...

In addition to maintaining availability of 2402-2417 MHz for use by Part 15 equipment, we are also providing for continued use of this band by the Amateur Service and upgrading the band from secondary to primary use by the Amateur Service. Both Part 15 manufacturers and Amateur Service licensees are familiar with operating in a shared radio environment, and we are unaware of any conflicts that have occurred between Part 15 and Amateur operations in this band. This action will essentially preserve the status quo regarding use of this band.

9. Thus, the band 2402-2417 MHz was only four years ago subject to an allocation proceeding in which the allocation status of the band was firmly determined. At that time, an Amateur primary allocation was created. The Amateur Service has developing uses of this band, including amateur video, displaced from lower shared allocations. It is impossible to suggest that interference from airborne, downlinked microwave signals as proposed in the City's application would not disrupt, on an unpredictable basis, amateur video, other amateur operations and extensive Part 15 devices and systems operating in the same band. The terrestrial amateur activities in the 2.4 GHz range were summarized in an amateur sharing study utilized by NTIA in its February, 1995 *Spectrum Reallocation Final Report* (See, Appendix B thereof) in response

to Title VI of the Omnibus Budget Reconciliation Act of 1993. A copy of that sharing study is attached as *Exhibit A* hereto. As noted therein, the reason why amateurs have been able to share this band with Federal government users is due to the fact that most Federal government operations are located away from populated areas, minimizing interference potential with amateur uses. This compatibility factor is absent in the City's proposal.

10. In the Los Angeles area, there is a significant present amount of amateur video operation. There are Amateur television (ATV) repeater inputs, centered at 2441.5 MHz. There are also video links at 2418 MHz. Approximately 100 such stations exist in southern California. The City's video will interfere with and be seen on the 1253.25 MHz and 3480 MHz ATV repeater outputs. These repeaters are also used for wide area RACES (Radio Amateur Civil Emergency Service) purposes by many municipalities in Los Angeles and Orange Counties. Because of the elevation of these ATV repeater inputs and links, there would be extensive interference to amateur operations from the proposed experimental facility. The ARRL Band Plan for this band shows three video channels for terrestrial ATV in the 2410-2450 MHz segment. There is no way to protect these repeater inputs from interference from the County's proposed video downlinks. Furthermore, amateur satellite operation is planned in the 2400-2410 MHz segment, which cannot sustain inevitable interference from wideband video at 2402 to 2448 MHz. The Southern California Repeater and Remote Base Association (SCRRBA) coordinates the 23 cm amateur allocation and ATV, and has coordinated multiple ATV repeaters and links, with more planned. The band is active with FM ATV due to the ready availability of low-cost Part 15 wireless television transmitters and receivers that are readily modified for higher power and use with high gain dish antennas for amateur operation. It is notable that amateur ATV

operators in the Los Angeles area spend considerable time and effort tracking down interference sources and informally solving them. A number of the sources are illegal business, local and State government agencies using television transmitters for various video uses.

11. Finally, the experimental application admits that the City is presently licensed for video operation of the exact type it proposes here, in the 2450-2483 MHz band, pursuant to Section 90.20(c) of the Commission's Rules. That rule section allows base or mobile public safety operations in the entire band 2450-2483.5 MHz, subject only to sharing between Part 90 public safety eligibles and broadcast auxiliary licensees (which operate pursuant to Section 74.602 of the Rules). As noted above, on September 1, 1999, the City, together with the County of Los Angeles, the City of Long Beach, and the City of Burbank, California requested from the Commission's Wireless Telecommunications Bureau and the Mass Media Bureau a declaratory ruling interpreting the rules that would establish the relative priority of public safety users and broadcast auxiliary users in that band, and the prior coordination requirements between the two. Thus, it is apparent that the instant experimental authorization is simply a means of expanding existing Part 90 provisions for public safety video operations in the 2.4 GHz band. The need for an experimental authorization in light of existing accommodations for public safety video in an adjacent segment has not been established.

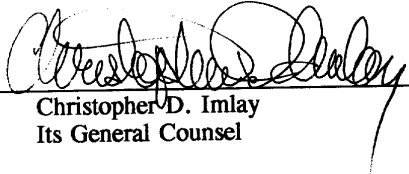
12. Under the circumstances, the experimental authorization clearly should not have been granted. There is not the slightest ability of the City to avoid constant, harmful interference from its planned extensive deployment of airborne video downlinks in an area in which there is increased deployment and development of primary Part 97 amateur operation. The application does not even attempt to indicate how such interference would be avoided. It merely claims that

there is little incumbent use of the band, but the application offers nothing in support thereof, and such a representation is irrelevant in an experimental application in any case. The City, in fact, knows of amateur video operation in the band, since radio amateurs have used their systems to provide video transmissions in emergencies for the benefit of local public safety organizations for many years. Those systems and other incumbent amateur uses stand to be seriously degraded or displaced by the deployment of the airborne system proposed by the City.

Therefore, for the foregoing reasons, the American Radio Relay League, Incorporated respectfully requests that the December 1, 1999 action of the Experimental Licensing Branch granting the experimental application of the City of Los Angeles be reconsidered and reversed; and that the application be denied.

Respectfully submitted,

**THE AMERICAN RADIO RELAY
LEAGUE, INCORPORATED**

By: 

Christopher D. Imlay
Its General Counsel

BOOTH FRERET IMLAY & TEPPER, P.C.
5101 Wisconsin Avenue, NW
Suite 307
Washington, DC 20016-4120
(202) 686-9600

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EXHIBIT A

APPENDIX B AMATEUR SHARING STUDY

INTRODUCTION

The preliminary reallocation plan identified the 2300-2310, 2390-2400, and 2402-2417 MHz bands as part of the 200 MHz to be reallocated to the FCC for non-Federal use. These bands are allocated to the amateur and amateur-satellite services on a secondary basis. Based on the public comments, subdividing the 2400-2450 MHz band into three parts, as proposed in the Preliminary Report, would not meet the needs of the principal users of the band. However, reallocating the entire 2400-2450 MHz band would give the FCC greater flexibility in developing a comprehensive plan to address the spectrum needs of the amateurs as well as the other users of the band. Therefore, the 2400-2402 and 2417-2450 MHz band segments will be included in the final reallocation plan for mixed Federal and non-Federal use.

Though NTIA's proposed reallocation to the FCC for non-Federal use does not in itself deny these frequencies to the amateur radio services, the amateur radio community believes these actions set the stage for the amateur services having limited access in the reallocated bands. Title VI requires that the Secretary of Commerce determine the extent to which, in general, the private sector can share the frequencies to be reallocated with the incumbent amateur radio licensees.¹ This requirement presupposes that NTIA knows the specific types of potential commercial and public-safety applications intended by the FCC for the reallocated spectrum, or at least the range of possible uses. Until candidate radio services are selected or at least identified, it is difficult for NTIA to conduct the mandatory sharing study required by Congress in Title VI. The only practical means for the Secretary to discharge NTIA's statutory obligation is to conduct a general sharing study based on information about present and near-term future amateur uses of the segments proposed for reallocation, and a range of possible commercial and public-safety applications.

AMATEUR BAND USAGE

The 2300-2450 MHz band comprises part of the spectrum known in the amateur community as the 13 cm band. The amateur allocation at 13 cm is currently split into two parts: 2300-2310 MHz and 2390-2450 MHz. A band plan outlining the structure of amateur spectrum uses and needs for the 2300-2450 MHz band is given in Figure B-1.² As indicated in the Figure B-1, the amateur radio community intends to develop the 2300-2450 MHz band for the following uses: weak-signal experimentation, narrowband and wideband point-to-point linking, satellite activities, and amateur television transmission.

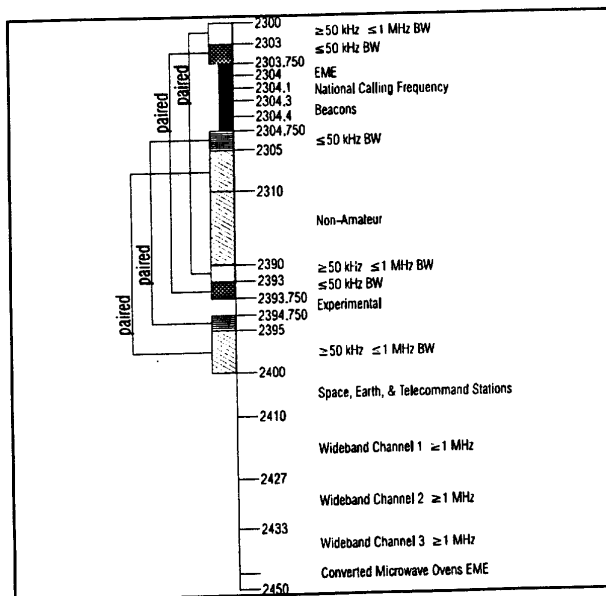


Figure B-1. 2300-2450 MHz Amateur Band Plan.

SHARING WITH AMATEUR OPERATIONS

The amateur radio service has successfully co-existed with Federal fixed, mobile and radiolocation services (i.e., radar) for nearly fifty years.³ As indicated in many of the public comments on the Preliminary Report and the FCC NOI, this sharing arrangement has been successful for both Federal and amateur spectrum users. This success is primarily due to the fact that much of the Federal spectrum usage is located away from populated areas, minimizing potential interference as well as the amateur's ability to utilize the guard bands placed between different types of Federal services.⁴ In addition to the Federal Government, the amateur radio service shares the 2400-2450 MHz segment with non-licensed devices and Industrial, Scientific, and Medical (ISM) devices. Recently, amateurs have indicated that there are practical problems sharing spectrum with commercial services that have a relatively high transmitter power, a high number of stations in heavily populated areas, and/or high duty cycle.⁵ The following paragraphs will examine in general the sharing possibilities for each of the four amateur radio operations that could be potentially impacted by the spectrum reallocation.

Weak-Signal Operations

Currently most amateur weak-signal operations take place at or near 2304 MHz. The comments submitted by representatives of the amateur radio service on the Preliminary Report indicate that the spectrum from 2448-2450 MHz is also of interest to amateurs involved in weak-signal operations.⁶ Amateurs are engaged primarily in employing weak-signal techniques for extended range communications.⁷ Weak-signal stations typically employ sensitive narrow bandwidth receivers (3 kHz or less), high transmitter power, and highly directional antennas. Most of the time the highly directional antennas are pointed well above the horizon.⁷ Based on these operational constraints the amateurs indicate that weak-signal stations could co-exist with certain commercial or public-safety terrestrial operations. The receivers used in weak-signal communications are sensitive and cannot operate in a high-noise environment; therefore, sharing with a high-power, high-density commercial application is considered impractical.⁸ Commercial satellite applications are also likely to conflict with typical weak-signal operations. The amateurs feel that satellite uplinks would be a problem since as a satellite transponder travels over the horizon, it could be easily saturated by the high-power signal emitted from a weak-signal transmitter.⁹ Satellite downlinks are also seen as potential problems because of the sensitivity of the weak-signal receivers

Television Operations

As shown in Figure B-1, amateur television (ATV) will occupy three channels: 2410-2427, 2427-2433, and 2433-2450 MHz. The concern expressed by the amateur community is that a loss of spectrum at the lower portion of the 2400 MHz band would force other displaced amateur operations into the ATV channels.¹⁰ With ATV likely to evolve to a digitally compressed format, it will have a better chance to co-exist in a high interference environment.¹¹ In addition, the rapidly expanding use of digital compression at reasonable costs may lessen the need of 40 MHz for ATV operations. However, the amateur commenters feel that if the spectrum is reallocated for commercial applications with a high duty

^a Amateur weak-signal stations communicate by many propagation methods such as tropospheric ducting and scatter; low atmospheric inversion ducting; refraction and reflection off natural objects (i.e., mountains); and EME (moonbounce), to name a few.

cycle, the band would be rendered virtually unusable for ATV.¹² Currently ATV operates in the presence of ISM and spread spectrum non-licensed devices. Most ATV operations are expected to occur in residential areas, or proximate to residential areas, with current uses primarily in metropolitan areas near cities and suburbs. The simplest type of commercial use to accommodate in these allocations would be licensed terrestrial point-to-point stations, or services not routinely located proximate to residential areas. Commercial or public-safety applications with low duty cycles would be more likely to avoid interference to and from ATV operations in the same band, and digital operation would be preferred over analog technologies. Wide bandwidth and spread spectrum uses are particularly suitable to sharing with ATV operations.¹³

Point-to-Point Operations

Point-to-point amateur operations involve paired frequencies with spacing from 40 MHz to 150 MHz. This is accomplished by using portions of the 2300-2310 MHz and the 2390-2400 MHz bands. Two bands are required because transmission and reception from one site simultaneously normally involves using different frequencies to increase isolation between the transmitter and receiver. Amateur point-to-point applications use high-performance receivers to ensure good path reliability. These receivers are protected by filters sufficient to reject their own transmitter operating on the same antenna. These filters are more than sufficient to reject near-band or out-of-band interference of any normal magnitude.¹⁴ The amateur fixed point-to-point services may effectively use the same spectrum as low-power spread spectrum or medium bandwidth digital commercial devices intended for localized uses.¹⁵ Several public-safety commenters to the FCC suggested that the 2390-2400 MHz band would be particularly suitable for the advanced private mobile communications technologies described in the COPE Petition, including private fixed service microwave operations at remote site locations.¹⁶ Electronic Toll and Traffic Management (ETTM) systems could possibly share with amateur point-to-point operations. ETTM systems are low-power, low duty cycle devices employing directional antennas.¹⁷ In general these systems will be used on highways away from residential areas where interference problems could be handled on a case-by-case basis. The amateurs also feel that high-power wide-area operations should be restricted in favor of more localized commercial and public-safety applications.¹⁸

Satellite Operations

Amateur-satellite downlink operations are planned for the 2400-2410 MHz portion of the 2300-2450 MHz band as shown in Figure B-1. However, all current and near future amateur-satellite usage can be accommodated in the 2400-2402 MHz band segment. TABLE B-1 gives a list of the amateur-satellite operations in the 2400 MHz band.¹⁹ The amateur-satellite community is planning to increase its use of 2400-2402 MHz to include uplinks on the next generation of satellites. Amateur-satellite operations employ a relatively weak signal and often use high-power

TABLE B-1
Amateur-Satellite Usage in the 2400 MHz Band

Amateur-Satellite	Band (MHz)
AMSAT-OSCAR 13	2400.711-2400.747 & 2400.650
UOSAT-OSCAR 11	2401.5
PACSAT (AO-16)	2401.1
Dove (DO-17)	2401.22
Phase 3D	2400.500-2400.900 & 2400.100-2400.500

terrestrial transmitters. This poses interference potential to adjacent operations and those operations pose potential interference to the terrestrial satellite receivers (most commonly through excessive sideband noise). The amateurs feel that any adjacent operations should be limited to an assigned occupied bandwidth of 50 to 100 kHz to minimize sideband noise. The amateurs contend that this bandwidth limitation for commercial and public-safety systems will also encourage the use of filtering on the adjacent systems receivers which will aid in protecting them from high-power satellite (terrestrial) transmitters.²⁰ In evaluating the feasibility of frequency sharing with the amateur-satellite service, it is important to realize two distinct types of satellites are employed in this service. One is the high-altitude, elliptical orbit type of satellite. The other, more numerous type is the low-earth-orbit (LEO) satellite, generally in circular orbits below 1000 kilometers in altitude. During approximately half the time in which an amateur LEO satellite is within range of an earth station, it is less than 10 degrees above the horizon. Thus, unlike commercial services using geostationary spacecraft, the elevation angle of amateur earth stations is unlikely to provide much, if any, relief from interference from and to terrestrial services.²¹ Spread spectrum local area networks can effectively share with amateur-satellite operations, because satellite receivers are generally not collocated with those type of devices.²² The amateur-satellite community as a whole is concerned about sharing spectrum with high-density mobile commercial services. The general consensus among amateur commenters is that it would be far less difficult to share with point-to-point microwave links since the chances of interference would be relatively slight and could be dealt with on a case-by-case basis.²³ Several public-safety organizations suggested that spectrum in the 2400-2450 MHz band could be used for private fixed microwave service operations in remote locations.²⁴ The amateurs also indicate that low-power, low duty cycle ETTM systems using directional antennas can also share with amateur-satellite operations.

SUMMARY

The importance of the 2300-2450 MHz band to the amateur radio service is principally in the near future. The sharing opportunities between amateurs and commercial services depend largely on the development of a sharing plan which will permit the orderly growth of the amateur users of the bands while at the same time supporting commercial and public-safety applications. The fundamental ability of the amateurs to continue operations in the reallocated bands is dependent largely on the characteristics of the commercial and public-safety applications that are to be added to the bands. TABLE B-2 provides an overview of the potential impact to current and future amateur operations and possible sharing options between the amateur service and commercial and public-safety applications.

TABLE B-2
Overview of Potential Impact to Amateur Operations and Sharing Options

Overview of Potential Impact to Amateur Operations and Sharing Options		
Amateur Operation	Potential Impact	Sharing Options
Weak-Signal		
2304 MHz	Potentially impacted by spectrum reallocation; Protecting 0.5 MHz around 2304 MHz would eliminate impact.	Federal Government; Non-licensed device (Part 15) applications; Certain commercial terrestrial and public-safety applications.
2450 MHz	Not impacted by spectrum reallocation. ^a	
Amateur TV		
Current analog	1 of 3 channels potentially impacted; Conversion of one ATV channel from FM to AM would minimize impact.	Federal Government; Industrial, scientific, and medical (ISM) applications; Part 15 applications.
Future digital	Expected minimal impact; at least 11 compressed video channels, each 3 MHz wide, will be available.	Federal Government; ISM applications; Part 15 applications; Commercial spread spectrum applications; Commercial or public-safety applications; Low duty cycle applications.
Point-to-Point		
Current narrowband	Potentially impacted by spectrum reallocation.	Federal Government; ISM applications; Part 15 applications.
Future wideband	30% of available band potentially impacted.	Federal Government; ISM applications; Part 15 applications; Commercial and public-safety point-to-point applications; Low-power commercial or public-safety spread spectrum applications; Electronic Toll and Traffic Management (ETTM) systems.
Satellite		
Current generation	Not impacted by spectrum reallocation. ^a	Federal Government; ISM; Part 15 applications; Spread spectrum Local Area Networks; Commercial point-to-point applications; Public-safety microwave operations in rural areas; ETTM systems.
Next generation	Not impacted by spectrum reallocation. ^a	
Long-term	Expansion beyond 2 MHz potentially impacted.	

^a This assumes that the FCC will take amateur usage of the band into consideration when identifying additional services to be placed in this spectrum.

ENDNOTES

Requests for copies of references from Federal departments and agencies should be referred to the originating organization. Parts of the reference material may be exempt from public release.

1. 47 U.S.C. § 923(c)(3)(C) (Supp. V 1993).
2. Southern California Repeater and Remote Base Assoc. (SCRRBA) Comments, at 10 (May 10, 1994), filed in response to NAT'L TELECOMMUNICATIONS AND INFO. ADMIN. (NTIA), U.S. DEP'T OF COMMERCE, SPECIAL PUBLICATION 94-27, PRELIMINARY SPECTRUM REALLOCATION REPORT (Feb. 1994) [hereinafter NTIA PRELIMINARY REPORT and all comments cited refer to this report, unless otherwise stated].
3. SCRRBA Comments, *supra* note 2, at 7.
4. *Id.*; American Radio Relay League Comments, at 8 (Nov. 6, 1992), filed in response to NTIA Notice of Inquiry in ET Docket No 92053-2132, 57 Fed. Reg. 25,010 (June 12, 1992) [hereinafter NTIA NOI]; Northern Amateur Relay Council of California Comments, at 3 (June 15, 1994), filed in response to FCC Notice of Inquiry ET Docket No 94-32, FCC 94-97, 59 Fed. Reg. 6005 (May 4, 1994) [hereinafter FCC NOI].
5. SCRRBA Comments, *supra* note 2, at 7; Radio Amateur Satellite Corp. (AMSAT) Comments, at 4 (June 8, 1994), filed in response to FCC NOI, *supra* note 4.
6. San Bernardino Microwave Society Inc. Comments, at 3 (May 2, 1994).
7. Southern California Repeater and Remote Base Assoc. (SCRRBA) Comments, at 13 (June 15, 1994), filed in response to FCC NOI, *supra* note 4.
8. AMSAT Comments, *supra* note 5, at 4.
9. SCRRBA Comments, *supra* note 7, at 14.
10. Northern Amateur Relay Council of California Comments, at 2 (June 13, 1994), filed in response to FCC NOI, *supra* note 4.
11. Northern Amateur Relay Council of California Comments, *supra* note 10, at 2.
12. SCRRBA Comments, *supra* note 7, at 4.
13. American Radio Relay League Comments, at 14 (June 15, 1994), filed in response to FCC NOI, *supra* note 4.
14. SCRRBA Comments, *supra* note 7, at 14.
15. *Id.* at 11.
16. Coalition of Private Users of Emerging Multimedia Technologies (COPE) Comments, at 5 (June 15, 1994), filed in response to FCC NOI, *supra* note 4.
17. Florida Dep't of Transportation Comments, at 1 (May 10, 1994).
18. SCRRBA Comments, *supra* note 7, at 10.
19. AMSAT Comments, *supra* note 5, at 5.
20. SCRRBA Comments, *supra* note 7, at 10.
21. Radio Amateur Satellite Corp. (AMSAT) Reply Comments, at 7 (June 30, 1994), filed in response to FCC NOI, *supra* note 4.
22. AT&T Corp. Comments, at 2 (June 15, 1994), filed in response to FCC NOI, *supra* note 4.
23. AMSAT Comments, *supra* note 5, at 4.
24. COPE Comments, *supra* note 16, at 5.

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, a principal of the law firm of Booth, Freret, Imlay & Tepper, P.C., do hereby certify that a copy of the foregoing *PETITION FOR RECONSIDERATION* was caused to be mailed, postage prepaid, to the following persons on this 8th day of December, 1999.

Mr. James Burtle, Chief *
Experimental Licensing Branch
Office of Engineering and Technology
Federal Communications Commission
445 Twelfth Street, S.W., Room 7-A267
Washington, D.C. 20554

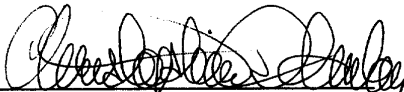
Mr. Dale Hatfield, Chief *
Office of Engineering and Technology
Federal Communications Commission
445 Twelfth Street, S.W., Room 7-C155
Washington, D.C. 20554

D'Wana Terry, Esquire, Chief *
Public Safety and Private Wireless Division
Wireless Telecommunications Bureau
Federal Communications Commission
445 Twelfth Street, S.W. Room 4-C321
Washington, D.C. 20554

Mr. William Cross *
Public Safety and Private Wireless Division
Wireless Telecommunications Bureau
Federal Communications Commission
445 Twelfth Street, S.W. Room 4-C403
Washington, D.C. 20554

Mr. Tun Aung, Manager
Public Safety Telecommunications Division
City of Los Angeles
Information Technology Agency
250 East First Street, Rm 1400
Los Angeles, CA 90012

* - via hand delivery


Christopher D. Imlay