

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

COUNTY OF LOS ANGELES

**Application for Airborne Microwave
Downlink Video Experimental License**

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File No. _____

**To: The Chief, Experimental Licensing Branch
New Technology Development Division
Office of Engineering and Technology**

**INFORMAL OBJECTION OF THE
AMERICAN RADIO RELAY LEAGUE, INCORPORATED**

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 1.41 of the Commission's Rules, hereby respectfully submits its opposition and objection to the August 9, 1999 application for an airborne microwave downlink video experimental license, filed by the County of Los Angeles (the County) on FCC Form 442. The application seeks authority to install and operate a microwave downlink system for public safety video at 2402-2448 MHz, comprising a four-channel system of helicopter transmitters. In the interest of the Amateur Radio Services in avoiding interference from the proposed experimental system, the League states as follows.

1. The County claims a need for experimental authorization to develop a video transmission system in the Los Angeles area for public safety purposes. It will construct and operate this system in order to demonstrate non-interference to existing users, preparatory to a

permanent allocation proposal. The video downlinks from helicopters would serve law enforcement, fire, disaster relief, and other public safety services by allowing video to be transmitted from RF cameras in helicopters to five remote receive sites 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. Municipalities in the general Los Angeles area will be served as well.

2. The application states that, for the development of this elaborate and expensive developmental system, the County has identified the spectrum at 2402-2448 MHz as a candidate band, which will allow the County to utilize four, 10 MHz video channels. By way of support for its claim that it can utilize this extensive video network without interference to incumbent users, the County submits a "monitoring study" which purports to demonstrate that the 2402-2448 MHz segment is "underutilized" spectrum. There is no compatibility showing included, so the monitoring study is the sole basis for the County's claim that interference from this system will not be suffered by incumbent users. Those users, according to the County, include "radio astronomy research, amateur radio, and...industrial/medical instrumentation..."

3. The League would suggest that the County has failed to justify the grant of an experimental authorization, especially one of this magnitude. Furthermore, it is readily apparent that the County'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 County cannot satisfy either of these conditions under its existing plan.

4. The County's proposed experimental authorization is a "foot-in-the-door" plan which would entail construction of the entire system at once, ostensibly merely to conduct interference studies. Interference studies cannot possibly require the construction of the entire system, with five receive sites, trackable antennas, GPS-based location systems, and terrestrial relay systems. Instead, it is obvious from the experimental proposal that the County wishes to construct the entire system and then simply stay there. If the Commission is inclined to grant any portion of this application, it should not authorize more than a single, 10 MHz video channel in this band, and a single transmitter aboard a single helicopter, to allow the alleged interference 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 County to install a comprehensive, wide-area video downlinking system on the justification provided would be tantamount to allowing the construction of a facility for which there is no Part 90 allocation, but which would be operated on a continuing basis.

5. 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. As discussed above, the only assertion made by the County relative to non-interference to incumbent users in the band 2402-2448 MHz is a monitoring study conducted over an unspecified "sample interval" taken from two "primary radio coverage sites in the County", Oat Mountain and Rio Hondo Hills. Though the County describes these as "extensive monitoring and data collection" which it believes demonstrates that the spectrum is "underutilized", that study, even if it had been conducted properly, would not have demonstrated that the experimental system proposed could operate without interference to incumbent licensees in the band. 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 County has not, and could not attempt to suggest by its study 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.

6. In any case, the monitoring study submitted is significantly flawed, and cannot contribute to any analysis of the ability of the applicant to avoid interference to incumbent users. The spectrum analyzer scans submitted by the County as Attachment 3 to the Application were apparently submitted with the intention of showing no activity on the band segment scanned. The monitoring study was conducted from two terrestrial sites (and not from helicopter platforms, which would be the conditions under which the deployed County system would operate). The images reveal a total of 72 spectrum scans on four different dates. Each represents approximately 0.1 *seconds* of monitoring time, with an aggregate of not more than 7.2 seconds of monitoring time represented by the scans. At the Rio Hondo site, a parabolic antenna with

a 7.5 degree beamwidth was employed, scanning 5 different headings, representing only 10% of the total 360-degree horizon. Those headings *exclude* the directions of amateur television repeaters in the band at Little San Geronio, Mt. Wilson and Santiago Peak.¹ Furthermore, the charts show that the study was conducted during a period of four days during 1999, each being a weekday, either early in the morning or in the middle of the afternoon:

February 8, 1999 (Monday) at approximately 3:00 PM, Rio Hondo Hills;

February 19, 1999 (Friday) at approximately 1:20 PM at Oat Mountain;

July 14, 1999 (Wednesday) at approximately 10:00 AM at Oat Mountain;

July 15, 1999 (Thursday) at approximately 7:00 AM at Oat Mountain.

These are hardly what the Commission could accept as "extensive monitoring and data collection to confirm the under-utilization of this band". Amateur activity is not at its peak during weekday morning and mid-afternoon periods, and the sample times from these two locations are not determinative of any level of incumbent amateur operation at any location.

7. The spectrum plots indicate that the noise figure of the equipment was in excess of 32 dB. A preamplifier should have been, but apparently was not used. For such studies, a noise figure of 2 to 4 dB would be reasonable. The measurement equipment apparently had a high noise level capable of covering numerous incumbent users' signals. Even given the 7.2 seconds of monitoring time, limited azimuths scanned, and the excessive noise level, some signals were detected. This would indicate a relatively high spectrum utilization. No attempt was made to

¹ The locations of Amateur television repeaters in the area are prominently listed in the ARRL Repeater Directory, published annually.

determine the identity of the signals detected, and no assessment was made of the interference potential to these users.

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 County'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 County'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. As proposed, the County's plan would result in airborne transmitters keying 2.442 GHz inputs on Santiago Peak, and at San Geronio, and the 2.417 GHz link ATV inputs at Santiago Peak. The County'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, and weak-signal terrestrial operation is of interest at 2448-2450 MHz, which cannot sustain inevitable interference from wideband video at up 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 notes that the County is presently licensed for video operation of the exact type it proposes here, at 2460.935 MHz, 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

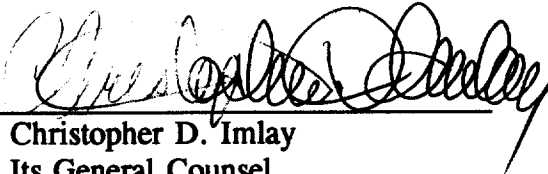
the Rules). On September 1, 1999, the County, together with the City of Los Angeles, the City of Long Beach, and the City of Burbank, California requested from the Commission's Wireless Telecommunications Bureau and the Mass Media Bureau a declaratory ruling interpreting the rules that would establish 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 accommodation 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 cannot be granted. There is not the slightest ability of the County to avoid constant, harmful interference from its planned extensive deployment of airborne video downlinks in an area in which there is increased deployment of Part 15 devices and developing, primary Part 97 amateur operation. The application does not even attempt to indicate how such interference would be avoided. Its sole effort was to attempt to show that there is little incumbent use of the band, but the limited monitoring study is woefully insufficient for the purpose, and would not be relevant to an adjudication of the experimental application in any case. The County, 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. Those systems and other amateur uses stand to be seriously degraded or displaced by the deployment of the system proposed by the County.

Therefore, for the foregoing reasons, the American Radio Relay League, Incorporated respectfully requests that the August 9, 1999 experimental application of the County of Los Angeles be denied.

Respectfully submitted,

**THE AMERICAN RADIO RELAY
LEAGUE, INCORPORATED**

By: 
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September 23, 1999

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, do hereby certify under penalty of perjury that I caused to be served, this 23rd day of September, 1999, via United States Mail, postage prepaid, a copy of the "INFORMAL OBJECTION OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED" on the following:

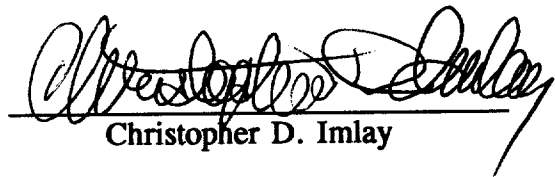
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