Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
COUNTY OF LOS ANGELES	)	**File No. 0217-EX-PL-1999**
	)	
Application for Airborne Microwave Downlink Video Experimental License	)	

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

REPLY TO OPPOSITION TO INFORMAL OBJECTION

ARRL, the National Association for Amateur Radio (formerly known as the American Radio Relay League, Incorporated) (ARRL), by counsel, hereby respectfully submits its reply to the "Opposition to Informal Objection of the American Radio Relay League" filed on or about March 9, 2000 by the County of Los Angeles, California (the County). The County opposes ARRL's Informal Objection, filed September 23, 1999, to the County's application for an airborne microwave downlink video experimental license, filed on FCC Form 442 on or about August 9, 1999. The application sought 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 operating throughout the Los Angeles Basin. The County's Opposition includes additional material allegedly justifying the experimental license application. In the interest of the Amateur Radio Services in avoiding interference from the proposed experimental system, ARRL states as follows.

1. The County's Opposition is substantially late. The ARRL Informal Objection was filed September 23, 1999. On October 1, 1999, the County requested a 21-day extension of time to respond to the Informal Objection, to which ARRL consented. On October 22, 1999 a request for a further extension of time, to and including November 24, 1999, was filed by the County, premised on the need to obtain a technical analysis from the County's engineering staff.[1] ARRL indicated that it would not oppose that request. However, thereafter, nothing was filed by the County (nor was counsel for ARRL contacted by any attorney for the County on the subject) until March 9, 2000, when the instant Opposition was filed. The late Opposition included no engineering analysis whatsoever, save for a monitoring study that was not conducted until the month of January, 2000. The County's opposition is therefore grossly untimely and should be dismissed.

2. The Opposition is stated in generalized terms, making a specific response difficult.[2] However, the County's premise, stated at page 1 of its Opposition, is that the Sheriff's Department and other County public safety agencies have long used helicopters and aircraft for surveillance and command and control operations, but they do not have the ability to transmit live video from those aircraft to command centers on the ground. *That claim is not correct.* The public safety frequency pool at Section 90.20 of the Commission's rules permits base and mobile operation at 2450-2483.5 MHz, shared with broadcast auxiliary and CARS licensees under Parts

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[1] Neither extension of time request was acted upon by the Commission.

[2] Notably, as well, it made no reference to the ARRL's arguments that the County's video downlinking needs are adequately addressed in the 2450-2483.5 MHz band, thus obviating any experimental purpose in the County's proposed use of the 2402-2448 MHz band. Nor did the County address the interference potential to Part 15 devices in the 2400-2450 MHz band, which the ARRL's Informal Objection squarely raised.

74 and 78, respectively. Though the band is shared, public safety entities are permitted video downlinks in that band. The County knows this, of course, because it has asked (as a separate matter in another proceeding) that public safety status at 2450-2483.5 MHz be elevated to essentially primary status relative to broadcast auxiliary and CARS operation. Thus, it is difficult to determine what the "need" is for the instant experimental authorization.

3. The ultimate need of an applicant for additional spectrum, or whether a particular spectrum allocation should be considered, is not relevant to whether an experimental authorization should or should not be granted. Rather, the issue is whether or not the application discloses an experimental purpose in accordance with Section 5.57(a) of the Rules, and whether the experimental operation can occur without interference to incumbent, licensed users, per Section 5.67(b) of the Rules. The County's application does not do that. Rather, it discloses a plan to simply occupy a band (2402-2448 MHz) used extensively for amateur television, with repeater inputs, for a use which is incompatible with incumbent operation, and which will inevitably cause interference to licensed Radio Amateurs.

4. Initially, the County stated that 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. Now, however, at page 2 of its Opposition, the County states that it

"intend(s) to share spectrum in a cooperative manner with the ARRL. We are not only willing to coordinate our vital airborne missions with the local coordinators, but we have designed a system with highly directional antennas, the best professional equipment available, and multiple sites so that interference can be best avoided." This is a completely hollow series of statements. Public safety video downlinks are not timed, and cannot be timed, to mesh with amateur operation in the same band. There is no showing as to how this "cooperative sharing" could possibly take place, since amateur operation in the band is often itinerant and unpredictable, as are the events to which the County would respond. Airborne mobile operations using multiple helicopters, multiple transmitters, and itinerant areas of operation cannot be successfully coordinated with incumbent users. The "highly directional antennas" allegation is relevant in terms of interference avoidance only to fixed operations, not aeronautical mobile downlinks to both fixed and mobile receive locations. Neither is the fact that the County intends to use the "best professional equipment available" relevant to interference avoidance in this context. As to the use of "multiple sites", many of those sites are also used for amateur television repeater inputs. Furthermore, the events to which the County is apt to respond and utilize such video services are likely the same times that Amateur Radio is fulfilling one of its own primary functions: providing emergency and public service communications.

5. By way of an attempt to show compatibility with incumbent users of 2402-2448 MHz, the County's Opposition included another "significantly expanded"[3] monitoring study. It claims (Opposition, page 3) that the study was not included in order to demonstrate that the proposed

[3] Virtually any study would be a significant expansion from the previously submitted study, which comprised a total of 7 seconds of monitoring, and was defective in many other respects already discussed. It is noteworthy that the County did not even attempt to defend that study.

developmental system would not cause interference or that the band 2402-2448 MHz was "underutilized". However, it specifically stated at page 1 of the narrative attachment to its initial application that the purpose of the experimental license is to demonstrate that public safety agencies can use commercial equipment "in the underutilized 2402-2448 MHz spectrum to transmit microwave video images from airborne platforms to benefit ground tactical operations." There is no purpose that could have been envisioned by the County for the monitoring study other than to attempt to show that the band 2402-2448 MHz is "underutilized". Indeed, at page 3 of its Opposition, the County claims that its purpose in conducting the study was "to obtain a reasonably accurate and real-time indication of current spectrum usage so as to better understand the relative loading, and to plan for minimizing potential interference to any existing user(s) during proposed test activities."

6. In fact, the earlier monitoring study and the current monitoring study are equally and fatally flawed, and present no accurate indication of current spectrum usage. In the Los Angeles County basin, the band 2400-2450 MHz is used predominantly (though not exclusively) as an input band for Amateur Radio repeaters and Amateur Satellite operations (upon the launch of AMSAT Phase 3D, expected in July of this year). Hence, any monitoring, such as was conducted with a directional antenna aimed at mountaintops, will have a low probability of receiving amateur emissions from the myriad of users in the Los Angeles Basin. Monitoring of repeater input frequencies, absent a directional antenna aimed at stations transmitting to that repeater input antenna, reveals nothing about the occupancy of a particular band. The Amateur television repeaters in the area have outputs in the 0.9, 1.2 and 3.5 GHz Amateur bands. Thus, any emissions by the County in the 2.4-2.45 GHz band will result in out-of-band, interfering

emissions by the County in several amateur bands. Amateur repeater inputs, located on mountain peaks such as Mt. Wilson, Oat Mountain, Santiago Peak, Little San Gorgonio and Blue Ridge that ring the Los Angeles Basin, will definitely be exposed to direct, line-of-sight interference from the County's helicopters. The Opposition of the County demonstrates that it does not have a fundamental understanding of the requirements or procedures to conduct the frequency coordination that it claims it intends to do. Neither has the County even attempted to date to contact local radio amateurs to determine whether such coordination is feasible.

7. Past Amateur Radio experience reveals beyond any reasonable doubt that harmful interference to amateurs will occur from the proposed experimental authorization. The United States Army at Fort Irwin, about 40 miles northeast of Barstow, California is now periodically transmitting 2.4 GHz analog FM video during the Army's tank war games. This video, transmitted from a helicopter hovering over the field at Fort Irwin, is regularly received by the Blue Ridge Amateur ATV repeater, located approximately 100 miles distant. The video is of P4 to P5 signal strength. If necessary, tapes of this interference can be provided to the Commission to demonstrate the problem.

8. Whatever the County intended to establish by the submission of its second flawed monitoring study of repeater input frequencies, it is disturbing that no other technical showing relative to interference avoidance plans has been provided by the County. It remains a mystery how the County intends to "coordinate" interference avoidance in this context. What coordination procedures and protocols does the County intend to use in order to avoid interference to and from amateur stations? Where are the proposed downlink receive locations relative to Amateur repeater inputs and outputs? What helicopter antennas will be used? Will these be tracking

antennas? How many of the four, 10-MHz channels (presumably using COFDM digital equipment) will be in use at any given time? That there was literally no coordination of the County's proposal with the Amateur community in Los Angeles prior to the filing of this experimental application (or since that time, to the present) makes the suggestion that operation in the band will be "coordinated" with the Amateur Service highly suspect. In any case, there is no workable interference avoidance plan proposed by the County; ARRL can think of no workable means of coordinating such, given the operational characteristics of each service; and the County has failed to provide any assurance that its operations will not cause harmful interference to incumbent amateur licensees. All we are offered is the County's unsupported assurance that, "(t)hrough use of coordination, frequency agility, directional antennas and application of technology, unintentional interference will be kept minimal." Nothing whatsoever supports this conclusion.

9. Again, the County has failed to justify the grant of an experimental authorization, especially one of this magnitude. The County's proposed downlink system will operate on an unpredictable, itinerant airborne basis, without any possibility of coordination with any of the existing Radio Amateurs in Los Angeles[4], and thus without any ability to operate on a non-interference basis. Section 5.67(b) of the Commission's Rules 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

[4] The County seems to be of the impression that frequency coordination in the Amateur Service covers all types of amateur operation. Such is not the case. Only fixed facilities such as repeaters, beacons and auxiliary links are subject to voluntary frequency coordination. Individual amateur station operation is not coordinated, but rather is subject to changes in schedule, is itinerant, and is subject to variation in operating parameters.

chapter." The County cannot comply with this provision.

10. The County, if it was serious about a program of experimentation to assess compatibility with incumbent users at 2402-2448 MHz, could more appropriately have arranged tests with the Amateur Service using frequencies at 2450-2483.5 MHz, where an allocation for public safety video already exists. Amateurs in Los Angeles would have been willing to conduct interference tests using Amateur stations which could be configured to receive in the latter band segment. The County's effort, however, is apparently not to determine interference parameters or demonstrate avoidance techniques. Rather, it is simply attempting to aggregate contiguous channels[5] that it can use on an intensive basis for public safety purposes.

11. The experimental authorization sought by the County cannot be granted. The County cannot avoid constant, harmful interference from its planned extensive deployment of airborne video downlinks in an area in which there is increased use of Part 15 devices and developing, primary Part 97 amateur operation. The application does not explain how such interference would be avoided, and neither does the County's Opposition. Its two monitoring studies are utterly useless in establishing relative levels of band occupancy, and they do not establish any basis for the County's vacuous claim that interference can be avoided.

[5] Contiguous, that is, to the 2450-2483.5 MHz band, where its purposes are already served through a Part 90 allocation.

Therefore, for the foregoing reasons, ARRL, the National Association For Amateur Radio, again respectfully requests that the August 9, 1999 experimental application of the County of Los Angeles be denied.

Respectfully submitted,

ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

By: _____
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April 19, 2000

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, do hereby certify under penalty of perjury that I caused to be served, this 19th day of April, 2000, via United States Mail, postage prepaid, a copy of the "REPLY TO OPPOSITION TO INFORMAL OBJECTION" on the following:

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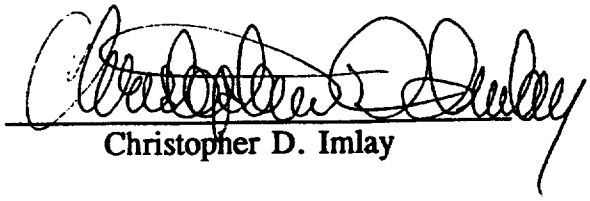

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