

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

**In the Matter of** )  
 )  
**Amendment of the Part 90 Rules in the 904-** ) **WT Docket No. 06-49**  
**909.75 and 919.75 - 928 MHz Bands** )

**To: The Commission**

**COMMENTS OF ARRL,  
THE NATIONAL ASSOCIATION FOR AMATEUR RADIO**

ARRL, The National Association for Amateur Radio, also known as the American Radio Relay League, Incorporated (ARRL), by counsel, hereby respectfully submits its comments in response to the Notice of Proposed Rule Making (the Notice), FCC 06-24, 71 Fed. Reg. 15658, released March 7, 2006. The Notice, which is in the nature of a Notice of Inquiry and which does not propose to adopt, modify or delete any rules, seeks information looking toward modifications in the licensing and use of frequencies in the 902-928 MHz band. Specifically, the Notice re-examines the portions of that allocation used for multilateration Location and Monitoring Service (LMS) at 904-909.75 MHz and 919.75-928 MHz (the M-LMS band). The Commission wishes to know whether greater opportunities can be provided for LMS service while continuing to accommodate licensed and unlicensed uses of the 902-928 MHz band. In response to the issues raised in the Notice, and in the interests of the Amateur Radio Service in use of the 902-928 MHz band, ARRL states as follows:

1. The Notice in this proceeding, fundamentally, asks how multilateration LMS can be encouraged or promoted. In PR Docket No. 93-61, adopted February 3, 1995, the Commission adopted rules for Location and Monitoring Service, replacing Automatic

Vehicle Monitoring (AVM) systems. A key feature was the establishment of separate sub-bands for wideband “multilateration” land mobile systems. ARRL suggests that looking only at the M-LMS band is an overly narrow analysis. Rather, ARRL would urge that the Commission look at the 902-928 MHz band allocations on a broader basis. The allocation status of the band is a patchwork of overlays, premised on the fundamental character of the band as a single-region Industrial, Scientific and Medical (ISM) band. The frequency 915 MHz is the center frequency of an ISM band only in International Telecommunication Union (ITU) radio Region 2. Then, in the United States, government radiolocation and a number of Commission-regulated, non-government services presumed capable of coexistence with ISM were added.

2. NTIA Special Publication 00-40, May 2000, gives an inventory of federal radar use. It shows that the Navy has search and surveillance radars operating in the 902-928 MHz band. The Air Force has range safety surveillance and instrumentation radars in this band. In Canada, the use by the radiolocation service is limited to Government of Canada ship-borne operations including along the coastlines of the Hudson Bay and James Bay and up the St Lawrence River.

3. Wind profiler radars operate in the band 904-928 MHz in accordance with ITU Resolution 217 and are authorized for both federal (operated by NOAA, NASA, DoE and NSF) and non-government use.<sup>1</sup> 915 MHz wind profilers are smaller and more affordable than those operating at 449 MHz and some are transportable. Wind profiler radar antennas are pointed upward and interference to other receivers is limited to about 5 km. Technical and operational characteristics of wind profiler radars in the vicinity of 1000

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<sup>1</sup> The Air Force, Army, Department of Energy, Navy, NASA and NSF list this band in their spectrum requirements for the foreseeable future. Department of Commerce, *Federal Radar Spectrum Requirements*, NTIA Special Publication 00-40, May 2000, available from the NTIA Web site.

MHz are documented in Recommendation ITU-R M.1227-2.

4. Part 15 users are permitted in this band, but must not interfere with, or be protected from any interference from, all other uses, including LMS and Amateur operations. Part 15 applications typically employ spread spectrum technology for applications such as cordless telephones, wireless local area networks for voice and data, and remote reading of utility meters. In 1995, the Commission estimated that several million Part 15 devices were sold and in daily use. Since then, however, many new Part 15 devices have migrated to the 2.4-GHz and 5-GHz bands. Radio-frequency identification (RFID) systems operating in the 902-928 MHz band cover a large area with reading distances of 3000-5000 ft, which are used for warehouses and other operations involving roving inventory.

5. Notably, ITU Regions 1 and 3 use the band quite differently. This is not the band for equipment that moves between Region 2 and the other Regions. For example, GSM 900-MHz cellular telephone handsets used in other Regions use frequencies as follows: 880.2 - 914.8 MHz Transmit; 925.2 - 959.8 MHz Receive. Thus, it is not possible for a European GSM cellular telephone handset to operate on this band in the United States.<sup>2</sup> Nor is it generally possible for equipment specifically designed for the United States 902-928 MHz band to operate in Europe. The difference in allocations between Region 2 and the other Regions is not a small point, particularly in this age of global commerce. A recent example is that radio frequency identification systems (RFID) may use the 902-928 MHz band in the United States but would not be acceptable for deployment in many other countries. It would be difficult at this late date to attempt to

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<sup>2</sup> As an accommodation to foreign delegates to the ITU 1998 Plenipotentiary Conference held in Minneapolis, on a temporary basis, the Commission permitted operation of a GSM 900-MHz cell site.

harmonize internationally the use of this band (at least from the United States' perspective), but part of the reason why multilateration LMS has not been more successful is perhaps due to the "orphan" allocation status of the entire 902-928 MHz band in ITU Region 2, and the inability to market M-LMS systems and products worldwide. This phenomenon has had an adverse impact on the Amateur Service as well. Radio Amateurs, though active in the band, as discussed below, are unable to use the band for international communications outside Region 2.

6. At Paragraph 11 of the Notice, the Commission establishes correctly that multilateration LMS has not been successful in the marketplace:

11. When the Commission adopted its LMS rules in 1995, it expected that both M-LMS and non-multilateration LMS systems would lay an integral role in the development and implementation of advanced radio transportation-related services. (Footnote omitted) Non-multilateration systems have flourished since 1995 with the Commission licensing more than 2,000 sites to state and local governments, railroads, and other entities in recent years. However, only two M-LMS licensees, Teletrac and Ituran, operate M-LMS systems, and these exist in only a small number of markets. (Footnote 32 omitted) These two licensees were grandfathered when the LMS rules were adopted, and neither of them acquired geographic licenses in Auction 21 or Auction 39. Moreover, none of the six license holders that received their licenses through these auctions or by subsequent transfer or assignment are providing location services (or any other Part 90 M-LMS compliant service (Footnote omitted)) with their spectrum.

Footnote 32 of the Notice states that only two M-LMS licensees operate these systems and these exist in only a small number of markets: Chicago, Dallas, Detroit, Houston, Los Angeles, San Diego and parts of Florida.

7. A basic question, given this, is whether present rules are the obstacle to M-LMS or whether time, and GPS technology, have passed it by. ARRL certainly agrees that there *is* a growing market for determination of vehicle or object location and the transmission of such information. Growth in location determination, however, seems to

be in the area of satellite-based systems such as GPS. Transmission of location information need not use the same system as used for location determination but can be integrated in, and incidental to, normal mobile-to-base radio communications and may be distributed throughout a network. To take an example from the Amateur Radio Service, Amateur (mobile) stations usually determine their locations via GPS. Location information is then transmitted via Amateur Radio using a system called APRS (Automatic Position Reporting System), on certain Amateur frequencies.

8. The Amateur Radio Service makes extensive use of the 902-928 MHz band.

The Amateur Radio Service is allocated the 902-928 MHz band on a secondary basis.

Amateur use is characterized by the national band plan adopted by the ARRL:<sup>3</sup>

902-903	Weak signal
902.1	Calling frequency
903-906	Digital (data)
903.1	Alternate calling frequency
906-909	FM (voice) repeater inputs
909-915	Amateur TV
915-918	Digital (data)
918-921	FM (voice) repeater outputs
921-927	Amateur TV
927-928	FM (voice) simplex and (auxiliary) links

While the above band plan is indicative of amateur applications, local band plans take precedence, as they take into consideration local amateur applications and compatibility with other services in the band. The two most heavily used Amateur Radio modes are weak signal communications in the 902.00-903.200 MHz segment (centered at 902.1 and 903.1 MHz), and repeaters throughout the band. Amateur weak signal operation (Morse telegraphy and single-sideband) has focused on two segments in particular in the United

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<sup>3</sup> ARRL, *The ARRL Repeater Directory, 2006-2007*, Newington, CT 06111, p33.

States: 902.000 to 902.200 and 903.000 to 903.200 MHz. In recent years, there has been a gradual increase of noise floor in the weak signal 902 and 903 MHz segments. ARRL would request that these segments in particular receive consideration for interference protection, such as limiting new applications, particularly those of high power density or duty cycles. Such an accommodation is necessary in order to protect the reception of very weak received signals from interference, especially from unlicensed systems, individually or in the aggregate. This request is consistent with policy adopted by CEPT. Footnote EU-17 in the European Table of Frequency Allocations codifies the policy of protecting Amateur weak-signal segments in microwave bands. EU17 reads as follows: “In the sub-bands 3400 - 3410 MHz, 5660 - 5670 MHz, 10.36 - 10.37 GHz, 10.45 - 10.46 GHz the amateur service operates on a secondary basis. In making assignments to other services, CEPT administrations are requested wherever possible to maintain these sub-bands in such a way as to facilitate the reception of amateur emissions with minimal power flux densities.”<sup>4</sup>

9. Amateur voice repeaters using this band are distributed widely throughout the United States, as follows:<sup>5</sup> Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia and Wisconsin. Amateur TV

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<sup>4</sup> See, <http://www.ero.dk/>, the *European Table of Frequency Allocations and Utilisations Covering the Frequency Range 9 kHz to 275 GHz*, Lisboa 2002, Dublin 2003, Turkey 2004, Copenhagen 2004.

<sup>5</sup> ARRL, *The ARRL Repeater Directory, 2006-2007*, Newington, CT 06111, p517.

repeaters with inputs, outputs or both in this band are located in:<sup>6</sup> California, Florida, Kentucky, Maryland, Mississippi, Missouri, Nevada, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Virginia, Washington and Wisconsin. Amateur repeater and ATV systems are not as susceptible to interference as are the weak-signal segments, but increases in the noise floor in this band in recent years has taken its toll in terms of interference reported by licensed radio amateurs.

10. ARRL's priorities in the future allocation status of this band include the continuation of the use of 902-903 MHz, and specifically 902.0-902.2 MHz and 903.0-903.2 MHz for weak signal amateur communications and avoidance of other applications that would raise the noise floor. The Amateur Service also requires the continued use of the 903.2-928 MHz band for amateur voice, television and digital communications shared with other licensed and unlicensed users of this spectrum.

11. The Notice in this proceeding specifically states that there is no intention to alter or disturb generally the allocation hierarchy in this band, which in summary is as follows: (1) Federal Radiolocation systems (primary); (2) ISM devices (primary); (3) Federal fixed and mobile (secondary to Federal Radiolocation and ISM); (4) LMS systems (secondary to all of the foregoing, and can cause no interference to, and must tolerate all interference from, the foregoing); and (5) Amateur Radio (secondary to all of the foregoing, including LMS). This "kitchen sink" of allocations is acceptable from ARRL's perspective, provided that the noise floor is regulated, in terms of aggregate noise levels from unlicensed devices. The high power levels permitted in this band in

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<sup>6</sup> ARRL, *The ARRL Repeater Directory, 2006-2007*, Newington, CT 06111, p541.

particular <sup>7</sup> bear careful watching, lest the allocated radio services, including Federal systems, suffer decreased utility of the band. Since there are no practical enforcement opportunities relative to unlicensed devices, the Part 15 rules are the only means of regulating the noise floor in multi-use, multi-allocation bands such as 902-928 MHz.

12. The Notice asks a series of questions concerning the specifics of the M-LMS bands in an effort to promote M-LMS. The Commission should leave the rules governing M-LMS as they are. The flexibility of the use of M-LMS is sufficient to encourage that service already, and the technical rules are sufficiently liberal as to allow any residual use of LMS to continue or expand as the marketplace may determine.

Therefore, the foregoing considered, ARRL, the National Association for Amateur Radio, respectfully requests that the Commission adopt or modify rules regarding the 902-928 MHz band only in conformity with the foregoing comments. The Commission must examine the 902-928 MHz band as a whole. Specifically, the needs of the Amateur Service in this proceeding are increased protection of weak-signal operations in the 902-903 MHz segment. Specifically, the 902.0-902.2 MHz and 903.0-903.2 MHz weak signal amateur communications require increased protection from other applications that would raise the noise floor in those narrow segments. The Amateur Service also requires the continued use of the 903.2-928 MHz band for amateur voice,

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<sup>7</sup> Part 15 rules permit 1 watt of power for Spread Spectrum devices and systems, and for broadband digital devices at, among other bands, 902-928 MHz. This power level is independent of duty cycle for the device or system.

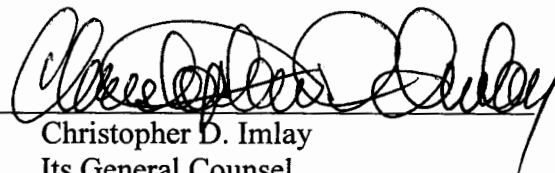


television and digital communications, coexisting with other licensed and unlicensed users of this spectrum.

Respectfully submitted,

**ARRL, THE NATIONAL ASSOCIATION  
FOR AMATEUR RADIO**

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