

# ARRL EMC Committee Semi-Annual Report

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**For The  
American Radio  
Relay League**

**Board of Directors Meeting  
January 21-22, 2005**

**Submitted By  
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Chairman, ARRL EMC Committee**

## **Mission Statement:**

The EMC Committee monitors developments in the Electromagnetic Compatibility (EMC) field and assesses their impact on the Amateur Radio Service. The Committee informs the ARRL Board of Directors about these activities and makes policy recommendations for further action, if appropriate.

The overall goals of the committee are:

- Advise the ARRL Board about issues related to radio-frequency interference
- Advise the ARRL HQ staff on the content of its publications
- Make recommendations to the ARRL Board and HQ staff

## **Members of the Committee:**

- Mr. Dennis Bodson, W4PWF, ARRL Roanoke Division Director, EMC Committee Chairman
- Mr. Jody Boucher, WA1ZBL, RFI troubleshooter, Northeast Utilities
- Mr. Ed Hare, W1RFI, ARRL Laboratory Manager, HQ Staff Liaison
- Mr. Ron Hranac, N0IVN, Board of Directors, Society of Cable Telecommunications Engineers
- Mr. Steve Jackson, KZ1X, VDSL and wireless communications
- Dr. Ron McConnell, W2IOL, T1E1.4 VDSL Standards Committee
- Mr. Mike Gruber, W1MG, ARRL Lab RFI Engineer
- Mr. Cortland Richmond, KA5S, EMC Engineer
- Mr. Mark Steffka, WW8MS, Automotive EMC engineer
- Mr. Walt Stinson, W0CP, ARRL Rocky Mountain Division Director
- Dr. Steve Strauss, NY3B, Home Phone Networking Alliance Technical Committee
- Mr. Hugh Turnbull, W3ABC, ARRL Honorary Vice President

## **HQ Staff:**

The role of the ARRL HQ staff consists of the following:

- Answer individual inquiries from hams (and sometimes their neighbors) about RFI problems
- Write and publish articles about RFI
- Write and publish the ARRL RFI Book
- Design and update ARRL's RFI web pages
- Maintain a database at ARRL to facilitate EMC case tracking and reporting
- Work with ARRL's D.C. office on various spectrum and RFI-related filings
- Maintain contact with industry
- Participate in standards and industry groups. This includes ANSI C63, Society of Automotive Engineers EMC and EMR committees, Home Phone Networking Alliance, VDSL, HomePlug, FCC and individual companies.

Mr. Gruber handles the majority of the staff work on EMC matters. In the 2<sup>nd</sup> half of 2004, co-wrote and edited an article for *Transmission & Distribution World Magazine* entitled "A Smarter Approach to Resolving Power-Line Noise." This article is aimed directly at the Electric Utility Industry. Committee members Jody Boucher and Ed Hare were also co-authors. Other co-authors included Riley Hollingsworth of the FCC and Terry Rybak of GM. This article describes in detail the steps utilities need to take to resolve power-line interference cases in a timely, effective and efficient manner.

## **Second Half 2004 Year Total RFI-case statistics:**

New RFI Cases - 229  
Total Cases Handled - 272  
New electrical power-line cases - 43  
ARRL Letters sent - 21  
FCC 1st Letters sent - 7  
FCC 2nd Letters sent - 6  
FCC Citations issued - 1  
FCC Field Investigations - 2  
EMC/RFI-related emails Total - 2220

## **Electric Utilities:**

Power-line interference has continued to be the single number one interference problem reported to ARRL HQ. These cases are being worked on by HQ staff, in cooperation with Riley Hollingsworth of the FCC. Several cases are being prepared for field investigation by the FCC. The FCC and HQ staff continue to discuss all open cases monthly.

## **Broadband Over Power Line (BPL):**

Broadband over power line (BPL) is the use of electrical wiring or power-distribution lines to carry high-speed digital signals. There are two types of BPL of concern to amateurs. Both *in-building* and *access* BPL have signals that occupy most or all of the HF range, extending into VHF. The power-line or electrical wiring can act as an antenna and radiate these signals. In-building BPL can be used to network computers within a building. It uses the building wiring to carry digital signals from one computer to another. Most in-building BPL operates under the HomePlug industry specification. Access BPL provides broadband Internet access to homes and businesses, using a combination of techniques and wiring. Although some BPL feasibility trials have shut down, the number of locations trying access BPL are increasing. In-building applications are also on the rise.

As part of his HQ staff work, Mr. Hare visited a number of BPL trial areas, documenting BPL interference and working with local BPL teams. He has also analyzed FCC filings and provided input to the League for use in its filings. This work has been generally reviewed by the Committee in draft form or discussed on the Committee reflector. The EMC Committee continues to monitor ARRL's overall BPL efforts and offer its guidance where appropriate.

ARRL's information on BPL is found at <http://www.arrl.org/bpl>

## **Automotive EMC:**

Mr. Hare continues as the ARRL representative on the Society of Automotive Engineers EMC and EMR Committees. The Headquarters staff continues to send all reports of automotive EMC problems to interested people in the automotive industry. While these reports are advisory, they are helpful to the industry in planning for future designs. At this time, Mr. Steffka has been involved in helping ARRL write a chapter in a new upcoming book on mobile radio. Specifically, this chapter will deal with automotive EMC issues.

## **Cable Television:**

As a whole, the cable industry continues to do a good job at adhering to the FCC's regulations about leakage and interference. ARRL has received few reports of problems, indicating that most systems are either clean or are addressing complaints effectively. The few cases ARRL has been involved with have been addressed through Mr. Hranac, the cable-industry member of this committee. He generally refers the report to the senior technical management of the involved cable company, who then in turn help the local system resolve the reported problem. The handful of cases with which Mr. Hranac has been involved in the last year have all been resolved satisfactorily.

### Additional Committee Activity:

Dr. Steve Strauss continues to monitor the reflector and then support local amateurs on an "as need be" basis when [EMC] issues arise. Mr. Richmond gave a presentation to the Mike & Key Club in Washington State on finding an interference source using a receiver and loop antenna.

### Database:

The ARRL HQ staff maintains a database of RFI reports and cases. This is used primarily as a case-management tool for the several hundred RFI cases ARRL handles every year, but the information the Lab staff are gathering about types of interference cases, involved equipment and frequencies will provide a wide range of reporting capability. Here are some statistics from the database for the 2<sup>nd</sup> half of 2004:

<b>RFI FROM:</b>	
Power Line Noise	44
Amateur Radio	29
Unknown	62
Appliances & Electrical Devices	17
Automotive	5
Computer	6
Electric Fence	5
Non-Amateur Transmitters	10
TV	8
Medical Device	6
Cordless Phone	5
CATV	5
Street Light	1
Railroad	1
Other	3
Miscellaneous	22
<b>TOTAL 2<sup>nd</sup> Half 2004 cases:</b>	<b>229</b>

<b>RFI TO:</b>	
Amateur Radio	167
FM & TV	6
Electrical Device	8
CATV	2
Stereo & Intercom	4
Medical Device (Pacemakers)	1
Automotive	3
Telephones	5
Alarm	1
Unknown	1
Cordless Phone	2
AM Broadcast Radio	2
Computer	4
Part 15 Device (Baby Monitor)	1
TV	12
Miscellaneous	10
<b>TOTAL 2<sup>nd</sup> Half 2004 cases:</b>	<b>229</b>

### Committees:

ARRL continues to be represented on professional EMC committees. Messrs. Bodson and Hare continue to represent the interests of Amateur Radio on the ANSI C63 RFI committee. Mr Bodson has been appointed as the C63 representative and HQ staff liaison; Mr Hare is ARRL's alternate. Mr. Hare serves as the chairman of Subcommittee 5, Immunity. Mr. Hare also chairs the C63 committee's ad-hoc working group on power-

line communications devices. This continues to be a hot topic of discussion at the C63 meetings.

The C63 committee is working on developing industry standards for immunity, emissions and testing of electronic devices. ARRL serves as a resource to the committee to protect the interests of Amateur Radio. Subcommittee 1 continues to work on a variety of EMC projects, primarily related to test site standardization. Subcommittee 5 deals with immunity and immunity measurement issues. Subcommittee 8 deals with various types of medical equipment. The ARRL EMC-Committee representation on C63 watches immunity and testing developments.

ARRL also continues its participation in the Society of Automotive Engineers EMC and EMR Committees. Mr. Hare is the ARRL representative on those committees. Mr. Steffka also serves on the committees, representing his employment in the automotive industry.

### **The Future of EMC and Amateur Radio:**

Interference to hams appears to be the present major work of the committee. Although immunity problems still do occur, this is being addressed at the national and international standards level. RFI from unlicensed devices poses a major real threat to Amateur Radio at this time. This will continue to require significant Committee and ARRL staff attention. To the extent possible with existing staff, or with additional resources, the ARRL should increase its contact with standards organization, industry groups and individual companies, and continue to work on all aspects of RFI problems and solutions.

ARRL's information about RFI can be read at <http://www.arrl.org/tis/info/rfigen.html>.