

ARRL EMC Committee Semi-Annual Report

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**For The
American Radio
Relay League**

**Board of Directors Meeting
July 18-19, 2008**

**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:

- Dr. Dennis Bodson, W4PWF, ARRL Roanoke Division Director, EMC Committee Chairman
- Mr. Mike Gruber, W1MG, ARRL Lab RFI Engineer, HQ Staff Liaison
- Mr. Jody Boucher, WA1ZBL, RFI troubleshooter, Northeast Utilities
- Mr. Ed Hare, W1RFI, ARRL Laboratory Manager
- Mr. Ron Hranac, N0IVN, Technical Leader, Cisco Systems; past member of the 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. Jerry Ramie, KI6LGY, ARC Technical Resources, Inc.
- Mr. Cortland Richmond, KA5S, EMC Engineer
- Mr. Mark Steffka, WW8MS, Automotive EMC engineer
- Dr. Steve Strauss, NY3B, Home Phone Networking Alliance Technical Committee
- Mr. Hugh Turnbull, W3ABC, ARRL Honorary Vice President, EMC Committee Member Emeritus
- Mr. Brent Zitting, KB4SL, International Broadband Electric Communications. Inc. (IBEC)

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 1st half of 2008, he also completed a new EMC Committee Web page a new conducted emissions test Lab. This capability will enable us to test consumer products for FCC Part 15 emissions limits below 30 MHz. We have already tested a battery charger that greatly exceeds the FCC conducted emissions limits and been reported to Chris Imlay.

First Half 2008 Year Total RFI-case statistics:

New RFI Cases – 154

New electrical power-line cases – 45

- ARRL Letters sent – 17
- FCC 1st Letters submitted – 4
- FCC 2nd Letters submitted – 1

EMC/RFI-related emails Total - 1236

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 during the first half of 2008. (Note: Riley Hollingsworth has now retired from the FCC as of July 3rd, 2008.)

As previously reported, two cases have now resulted in a formal field investigation. The first official FCC citation was issued by the Tampa Field Office on May 16, 2006. The Lakeland case however remains ongoing.

As reported in the January 2008 EMC Committee Report, two FCC agents from the Tampa Field Office attended Mike Martin's RFI Workshop in November of 2007. As part of the workshop training, Mr. Martin and the agents found two of the several sources affecting the Lakeland complainant, JC Flynn, W4FGC. Although the utility reported to

the FCC that the noise has been corrected, Mr. Flynn reports the noise is ongoing at the time of this report. The utility has been unresponsive and still lacks the proper equipment and expertise to handle a power line noise complaint. We are still waiting to see what action the Tampa Field Office will take in this matter.

The FCC and HQ staff had continued to discuss all open cases monthly up until the time of Mr. Hollingsworth's retirement. Although Mr. Hollingsworth is no longer with the FCC, developing a strong case for enforcement action against an offending utility remains a primary goal of Mr. Gruber. In addition, he completed a draft detailing internal procedures and guidelines for Mr. Hollingsworth to help train his successor. Since a successor had not been named at the time of Mr. Hollingsworth's departure, Mr. Hollingsworth was unable to use it for its original intended purpose. He has now suggested that it be used as a training manual at the FCC, a purpose that he will attempt to implement during the next several weeks.

Mr. Gruber is also planning to host a power line noise Workshop at ARRL HQ in September of 2008. The Workshop will be conducted by Mike Martin of RFI Services. Plans are also still ongoing to conduct a specialized version of the Workshop for FCC personnel in Gettysburg.

EMC Committee Web Page

Mr. Gruber completed the new EMC Committee Web page. This page was discussed during the Committee meeting in May of 2007. It includes links to Committee reports, meeting minutes, bios and other relevant Committee information. The URL is:

www.arrl.org/tis/info/emccom.html

Committee Membership

Jerry Ramie, KI6LGY, of San Jose, California has been appointed to serve on the EMC Committee as a Power Industry consultant. Although Mr. Ramie is a relatively new ham and ARRL member, he founded ARC Technical Resources, Inc. in 1989 and has spent over 25 years in Regulatory Compliance and the EMC industry.

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 utilities trying access or utility-applications BPL continues to be slowly increasing. In-building applications are also on the rise.

There were a number of developments related to BPL that occurred in the first half of 2008:

- New interference reports have dropped somewhat. The BPL industry has been pretty consistently notching BPL in the ham bands, to good effect. From site visits by Mr. Hare to 4 different notched areas, if the system operates below the FCC limits, noise in the ham bands is minimal or non-existent. It is not at all certain that the systems deployed at this time all operate below the FCC limits, however. Additional measurements at some locations are planned over the summer.
- Mr. Hare continues to represent Amateur Radio's stake in BPL standards development on various industry committees. These include the IEEE P1775 BPL EMC committee; the [IEEE EMC Society Standards Development Committee](#) and [ANSI ASC C63™](#). The P1775 BPL EMC standard failed to be accepted by the sponsoring IEEE Societies, so it was sent back to the Working Group for more work. At the last meeting in June, 2008 in Piscataway, NJ, the Working Group considered a new informative annex that addressed how BPL could avoid causing interference and how to address interference should it occur. The Working Group tabled a decision on the new annex, to be considered at an upcoming P1775 Working Group teleconference.

ARRL's information on BPL is found at www.arrl.org/bpl.

Automotive EMC:

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. Mr. Steffka, along with Mr. Gruber, developed an exhibit and gave a presentation at the Dayton Hamvention in May. Mr. Steffka also helped prepare some responses to Technical Information Services (TIS) questions for ARRL members. Mr. Hare continues as the ARRL representative on the Society of Automotive Engineers EMC (Electromagnetic Compatibility) and EMR (Electromagnetic Radiation) Committees.

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. All of the handful of cases with which Mr. Hranac has been involved in the last six months have all been resolved satisfactorily.

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 1st half of 2008:

RFI COMPLAINTS BY SOURCE:	
Power Line Noise	45
Amateur Radio	24
Unknown	31
Appliances & Electrical Devices	9
Automotive	3
Computer	2
Electric Fence	2
Non-Amateur Transmitters	4
TV	8
Medical Device	0
Cordless Phone	0
CATV	2
Street Light	1
Lighting & Lighting Device	4
Miscellaneous	10
BPL	1
Furnace	4
Lighting Device (Consumer)	4
TOTAL 1st Half 2008 cases:	154

RFI COMPLAINTS BY VICTIM:	
Amateur Radio	117
BC Radio	1
Stereo & Intercom	7
Automotive	2
Telephones	3
Unknown	2
Computer & Related Devices	6
TV	5
Miscellaneous	8
GFCI	3
TOTAL 1st Half 2008 cases:	154

Committees:

ARRL continues to be represented on professional EMC committees. Messrs. Hare and Bodson continue to represent the interests of Amateur Radio on the ANSI ASC C63TM RFI committee. Mr. Hare is the ARRL C63TM representative; Dr. Bodson is the 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>.