

ARRL EMC Committee Semi-Annual Report

Doc. # 24

**For The
American Radio
Relay League**

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

**Submitted By
Dennis Bodson, W4PWF
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; 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. Cortland Richmond, KA5S, EMC Engineer
- Mr. Mark Steffka, WW8MS, Automotive EMC engineer
- Dr. Steve Strauss, NY3B, Home Phone Networking Alliance Technical Committee
- Mr. Brent Zitting, KB4SL, International Broadband Electric Communications. Inc. (IBEC)
- Mr. Hugh Turnbull, W3ABC, ARRL Honorary Vice President, EMC Committee Member Emeritus

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 2nd half of 2007, he also started and substantially completed a new EMC Committee Web page. He also started work on a new conducted emissions test Lab to be completed in 2008.

Second Half 2007 Year Total RFI-case statistics:

New RFI Cases – 151

New electrical power-line cases – 39

- ARRL Letters sent – 14
- FCC 1st Letters submitted – 5
- FCC 2nd Letters submitted – 2

EMC/RFI-related emails Total - 1871

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.

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 Dallas Field Office has now issued citations to each of the two involved utilities in the Lubbock case on July 25, 2007. Consultant Mike Martin of RFI Services was subsequently hired by Xcel Energy to locate all noise sources from both utilities affecting the complainant. As a result, Mr. Martin visited Lubbock for a week in October and worked with both utilities to resolve the issue. The Lakeland case however remains ongoing. Two FCC agents from the Tampa Field Office attended Mike Martin's RFI Workshop in November. As part of the workshop training, Mr. Martin and the agents found two 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. Furthermore, he was never contacted by the utility since the FCC visited his residence in November

The FCC and HQ staff continues to discuss all open cases monthly. Developing a strong case for enforcement action against an offending utility continues to be a primary goal of Mr. Gruber. In addition, he is writing a draft for internal procedures and guidelines to be used by the FCC for investigating a power line noise case. Mr. Gruber is also planning to host a power line noise Workshop at ARRL HQ sometime in the second half 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 substantially 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

Brent Zitting, KB4SL, of Huntsville, Alabama has been appointed to serve on the EMC Committee as a BPL Industry Representative. Mr. Zitting, a 25-year ARRL member, is employed by IBEC, a BPL manufacturer and integrator located in Huntsville, Alabama.

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 is 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 2007:

- [The BPL situation in Manassas, VA](#) has continued to remain mostly unresolved. Ed Hare did testing in Manassas that showed strong interference in some parts of the system. Interference complaints continue to come from local Amateurs in Manassas. ARRL has formally complained to the FCC about their handling of the interference reports.
- Other BPL manufacturers, electric utilities and BPL operators have continued to work with ARRL. At this point, ARRL has ongoing dialogue with HomePlug, a consortium of in-premise BPL manufacturers and DS2, a BPL chipset manufacturer used in many BPL designs. ARRL has ongoing dialogue with Amperion, Corinex, Current Technologies, IBEC and Motorola, the majority of BPL manufacturers. These contacts are proving fruitful, as many of the systems deployed are indicating in the BPL database that they are notching the Amateur bands.
- The BPL system in Concord, MA reported in the last Committee report has not yet come on line. There were contract issues between the utility and BPL companies and they are essentially starting from scratch.
- New BPL systems continue to come on line, or at least to appear in the BPL database. Central Michigan is process of getting BPL, as just one example.
- 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™](#).

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, wrote some material that appeared *QST* concerning mobile installations. They also agreed to discuss plans for a Dayton exhibit in the early part of 2008. 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 2nd half of 2007:

RFI COMPLAINTS BY SOURCE:	
Power Line Noise	39
Amateur Radio	25
Unknown	35
Appliances & Electrical Devices	6
Automotive	6
Computer	5
Electric Fence	2
Non-Amateur Transmitters	6
TV	5
Medical Device	3
Cordless Phone	1
CATV	2
Street Light	2
Lighting & Lighting Device	8
Miscellaneous	5
BPL	1
TOTAL 1st Half 2006 cases:	151

RFI COMPLAINTS BY VICTIM:	
Amateur Radio	102
BC Radio	5
Stereo & Intercom	3
Automotive	4
Telephones	3
Unknown	3
Computer & Related Devices	8
TV	13
Miscellaneous	5
	5
TOTAL 1st Half 2007 cases:	151

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 C63™ RFI committee. Mr. Hare is the ARRL C63™ 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.

Mr. Hare was also appointed to serve on the IEEE BPL-standards committee, serving on its EMC Working Group. He also serves on the IEEE EMC Standards Development Committee, where he serves as its Secretary and chairs their BPL/PLC study project.

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>.