

Protecting Our Bands: More than Meets the Eye

The ARRL's defense of frequencies mission can be expressed in three words: "Don't lose spectrum!" Why? Simply this: Without spectrum there is no Amateur Radio!

There's good news and bad news, so the saying goes. The good news is that the Amateur Radio Service has a number of frequency allocations (albeit relatively narrow ones) throughout the radio spectrum. The bad news is that those looking for new uses of radio like first to look in other people's spectrum rather than their own. They seem to think the amateur allocations are easy prey.

It's the job of the ARRL Technical Relations Office (TRO) in Fairfax, Virginia to protect our bands at the federal level in Washington and internationally. The ARRL through its TRO is well known to the government agency spectrum managers and their counterparts in industry. It's time we gave our members a more complete look at what the ARRL does through its Fairfax office.

Some Background

Everyone seems to know about the so-called "WARC bands" and possibly that we got them at the 1979 World Administrative Radio Conference (WARC-79). Until 1993, there were a lot of single-issue WARC's every few years but the big ones involving wholesale reshuffling of the spectrum occurred much less frequently. ARRL and the IARU geared up



ARRL General Counsel Chris Imlay, W3KD (left), with Technical Relations Manager Paul Rinaldo, W4RI.

for the major WARC's, fought the campaign and then returned to hamming as usual. In between WARC's, there were meetings of ITU Study Groups that required attendance by ARRL and IARU

about once a year, and volunteers were enlisted to cover them. Sleepier times for telecommunications ended in the 1980s and the ITU knew it had to pick up the pace. The 1993 World Radiocommunication Conference (new name and abbreviation—WRC) met only to set the agenda for WRC-95. The plan was to hold WRC's every two years. WRC-97 took place, but WRC-99 slipped to WRC-2000 and the pattern now is a WRC every three years. The Study Groups were charged with doing the detailed investigations of each item on the agenda of the next WRC and possibly the subsequent one. Also, a permanent Conference Preparatory Meeting was established to bring all the studies together about six months before a conference and produce a thick report to serve as the technical basis for the WRC.

This three- or four-fold quickening of the ITU calendar was needed to fast-track new radio applications such as third-generation cellular systems and new satellite systems. Advocates of these emerging technologies gathered technical experts who championed their technical papers through the Study Groups, drafted position papers and prepared proposals for upcoming WRC's. But the incumbent services, such as the amateur and amateur-satellite services, had to marshal their forces as well and avoid being blindsided at each step along the path toward a possible allocation action. In the early 1990s, it became clear to the ARRL leadership that effective spectrum protection required a change from a now-and-then volunteer response to a full-time staff.

There was also the question of how to pay for it. The "Defense of Frequencies" fund was given new life by annual appeals to ARRL members. The Board of Directors saw it not as a question of

Who's Who: Team TRO

The TRO has a staff of four: Technical Relations Manager Paul Rinaldo, W4RI; Technical Relations Specialists Walter Ireland, WB7CSL, and Jonathan Siverling, WB3ERA; and Administrative Assistant Claudia Campa. Domestically, the TRO is part of the ARRL Washington team consisting of President Jim Haynie, W5JBP; Executive Vice President David Sumner, K1ZZ; General Counsel Christopher Imlay, W3KD; and Legislative and Public Affairs Manager Steve Mansfield, N1MZA. Internationally, it becomes more complicated because the TRO receives guidance not only from Sumner but also from International Affairs Vice President Rod Stafford, W6ROD, and International Amateur Radio Union (IARU) President Larry Price, W4RA.

ITU Alphabet Soup

BDT—Telecommunication Development Bureau
BR—Radiocommunication Bureau
CPM—Conference Preparatory Meeting
ITU—International Telecommunication Union
ITU-D—Telecommunication Development Sector of ITU
ITU-R—Radiocommunication Sector of ITU
ITU-T—Telecommunication Standardization Sector of ITU
JRG 8A-9B—Wireless Access, including Radio Local Area Networks (RLAN)
JTG 1-6-8-9—Multimedia applications
JTG 4-7-8-9—5 GHz band allocations
PP—Plenipotentiary Conference
SC—Special Committee on Regulatory/Procedural Matters
SG1—Spectrum Management
SG3—Radiowave Propagation
SG4—Fixed-Satellite Service
SG6—Broadcasting Services
SG7—Science Services
SG8—Mobile, Radiodetermination, Amateur and related Satellite Services
SG9—Fixed Service
TG 1/7—Protection of passive service bands from unwanted emissions

TG 6/7—Planning parameters for digital broadcasting at frequencies below 30 MHz
TSB—Telecommunication Standardization Bureau
WP 1A—Engineering principles and techniques, including computer-aided analysis for effective spectrum management
WP 1B—Principles and techniques for spectrum planning and sharing
WP 1C—Techniques for spectrum monitoring
WP 6E—Terrestrial emission
WP 7C—Earth exploration satellite systems and meteorological systems
WP 7D—Radioastronomy
WP 7E—Inter-service sharing and compatibility
WP 8A—Land mobile service excluding IMT-2000; amateur and amateur satellite services
WP 8B—Maritime mobile service including global maritime distress and safety system (GMDSS); aeronautical mobile service; and radiodetermination service
WP 8D—All mobile-satellite services and the radiodetermination-satellite service
WP 8F—IMT-2000 and systems beyond IMT-2000
WP 9C—HF Systems
WRC—World Radiocommunication Conference

whether we could afford it, but as something we could not afford not to do.

The WRC Calendar Drives the Process

The agenda for each WRC is known about three years in advance. It is established by the previous WRC and is blessed by the ITU Council, which meets yearly. WRCs also project six years ahead to the subsequent WRC and agree on a preliminary agenda for that as well. These agendas for the next two WRCs form a “to do” list for nearly everyone in the ITU WRC and Study Group process. Even before the ink is dry on an agenda, there is a group that meets at the WRC site to parcel out the work to Study Groups responsible for studies relating to the item. If an item concerns a broadcasting allocation, the Study Group responsible for broadcasting gets the action but Study Groups for other radio services are inevitably involved. This is often a “zero-sum” game, meaning that one service’s gain could be another service’s loss. More often these days, it is more a matter of increased sharing. The object is to stuff as many compatible services in one band as possible. Whether it’s zero-sum or more sharing, no one is making any new radio spectrum.

Take for example our 40-meter realignment, which is agenda item 1.23 for WRC-2003. Study Group 8 (mobile, radiodetermination and amateur services) is responsible for the studies. More specifically, the action is handled by Working Party 8A (land mobile and amateur

services). However, finding 300 kHz worldwide for the amateur service requires some adjustment in allocations for the broadcasting service around 7 MHz, so Study Group 6 (broadcasting services) is an interested party. The actual studies from the broadcasting viewpoint are performed by Working Party 6E (terrestrial emissions). Probably, there would be an inevitable impact on Study Group 9 (fixed service) and its Working Party 9C (HF fixed), not only because of a possible amateur band shift but also because the broadcasters want more spectrum. Broadcasters have another agenda item to study the adequacy of BC spectrum from about 4 to 10 MHz. They’re also planning conversion from double-sideband AM to digital broadcasting, which will undoubtedly involve dual transmissions during a long transition period. Suffice it to say that a modification of an allocation in one band can cause a ripple effect throughout the spectrum.

The task of the TRO is to cover the Study Group and Working Party meetings, submit papers advocating our cause, respond to documents that give us concern and generally participate in the studies. Each issue is projected over years of domestic preparatory meetings and international meetings. In just the technical studies, there are typically three or four ITU meetings to consider an issue. For every ITU Study Group, Working Party and Task Group (to handle certain specific issues) there is a shadow US preparatory group that typically meets monthly

to consider US input papers and to review documents from foreign sources.

ITU Study Group Meetings

Our “home” within the ITU Radiocommunication Sector is Study Group 8, more specifically Working Party 8A, as discussed above. They both meet yearly, usually in Geneva, Switzerland. Depending on the amount of business, WP 8A meetings last anywhere from 5 to 10 working days and SG 8 meets for about two days. Internationally, WP 8A is divided into even smaller Working Groups. Paul Rinaldo, W4RI chairs WG 1 (amateur services). IARU President Price and Ken Pulfer, VE3PU, are regular participants. Back in Washington, WP 8A preparations are split in two: Eric Schimmel of the Telecommunications Industry Association (TIA) chairs Ad Hoc 8A (land mobile) and Rinaldo chairs Ad Hoc 8E (amateur services). Walt Ireland, WB7CSL, serves as recording secretary for Ad Hoc 8E.

TRO staff also attends the meetings not only of Ad Hoc 8A but also the rest of the SG 8 family: 8B (radiodetermination, ie, radiolocation and radionavigation), 8D (mobile satellites) and 8F (IMT-2000 and beyond—third and fourth-generation cellular). This is done to see who might be interested in our frequencies as well as to keep abreast of rapidly changing technologies. For six years during the ’90s, Rinaldo chaired Task Group 8/2 charged with developing standards and finding spectrum for wind

profiler radars. While we knew beforehand that wind profilers would operate in radiolocation bands shared with amateurs, we succeeded in keeping the impact as small as possible.

TRO covers Study Group 1 (spectrum management), its Working Parties and Task Groups. Working Party 1A deals with spectrum engineering, WP 1B with spectrum management concepts, WP 1C with monitoring and TG 1/7 with unwanted emissions from satellites to passive radio services such as radio astronomy. TRO attends all the international and US preparatory meetings of SG 1 except, for the moment, those of TG 1/7. This Task Group is currently studying commercial satellite unwanted emissions against a WRC-2003 agenda item. They're not after amateur satellites—at least yet—because the interference potential is not as great as from commercial satellites. However, ARRL was heavily involved in SG 1's past two Task Groups. Laboratory Supervisor Ed Hare, W1RFL, attended meetings of TG 1/3 on unwanted emissions. Unwanted emissions consist of out-of-band (OOB) emissions close in frequency to a signal and resulting from modulation, and spurious emissions that lie further out. The studies were reconstituted in TG 1/5 in which Rinaldo participated as chairman of the drafting group that completed an 80-odd page ITU-R Recommendation on OOB. Other Amateur Radio participants who played important roles in these Task Groups were Peter Chadwick, G3RZP, Ken Pulfer, VE3PU, Hans-Joachim Brandt, DJ1ZB, and Jay Oka, JA1TRC. Had ARRL and the other societies not been involved, the amateur services could have been subject to new rules on unwanted emissions that could have increased the cost of amateur equipment and restricted home-brewed transmitters.

Study Group 6, mentioned earlier, has a large number of Working Parties dealing with the various aspects of sound and television broadcasting. The TRO participates in SG 6 and WP 6E to protect our HF allocations and to contribute to studies leading to gaining an allocation of 300 kHz at around 7 MHz. Ireland came to the ARRL from the International Broadcasting Bureau/Voice of America, and has been our principal participant in SG 6 and WP 6E. He serves as Deputy Head of Delegation to WP 6E meetings. Ireland also serves as Special Rapporteur for WP 6E Special Rapporteur Group 2 (SRG 2) on CPM-related issues for broadcasting agenda items. He is also covering Task Group 6/7 dealing with the introduction of digital sound broadcasting, which will place new demands on HF spectrum.



WB3ERA and fellow TRO staff member Walt Ireland, WB7CSL (right), at the recent WRC-2003 Advisory Committee meeting at the FCC.

Sumner is also attending the WP 6E and SG 6 meetings leading up to WRC-2003. He participates in his capacity as Secretary, IARU. He is joined by IARU technical representative Wojciech Nietyksza, SP5FM, who is well known to ITU and CEPT.

Study Group 7 is responsible for science services: WP 7A (time and frequency standards), 7B (space operations), 7C (earth exploration), 7D (radio astronomy) and 7E (sharing studies). The TRO staffers regularly participate in WPs 7C, 7D and 7E. WP 7C is studying a possible allocation of 6 MHz bandwidth in the 420-470 MHz band. They would like to center it at 435 MHz, possibly because the proponents thought the amateur services were a "soft target." The name of the game is to find compatible sharing partners. The proponents have yet to show how they can point a radar signal from a satellite toward the Earth without causing harmful interference to radiolocation and amateur stations. Amateur satellites, as well as the International Space Station, could also be affected. These studies are in preparation for WRC-2003. Ireland has been the principal WP 7C participant for ARRL. The TRO follows 7D (radio astronomy) and participated in the studies leading to the reshuffling of allocations above 71 GHz that was settled at WRC-2000. The next issue is studying which bands are suitable for the amateur services in 275-1000 GHz, which may be subject to allocation at WRC-2006.

ARRL does not routinely participate in the other ITU-R Study Groups: 3 (propagation), 4 (fixed satellite service) or 9 (fixed service). Nevertheless, we

benefit from ITU-R propagation studies and at least temporarily are interested in fixed service frequencies around 7 MHz to the extent that they may be involved in our achieving 300 kHz worldwide.

The US WRC Proposal Process

While the work of the ITU Study Groups is captured in a Conference Preparatory Meeting report, which forms the technical basis for a WRC, no action can be taken at a conference without specific proposals from ITU Member States. The United States usually develops numerous proposals on a wide variety of agenda items over a period of about two years prior to a WRC. Proposal development is a bottom-up process initiated by the entity that wants something or in some cases to insist that things not be changed.

The United States has two agencies regulating the radio spectrum: NTIA for federal government agencies and FCC for everyone else. Not surprisingly, there are two proposal development processes: NTIA has a Radio Conference Subcommittee (RCS) of the Interdepartment Ra-

NTIA Alphabet Soup

IRAC—Interdepartment Radio Advisory Committee

ITS—Institute for Telecommunication Studies (Boulder, CO)

OIA—Office of International Affairs

OSM—Office of Spectrum Management

RCS—Radio Conference Subcommittee (IRAC)

dio Advisory Committee (IRAC)—that's closed to everyone except government agencies. The FCC has the WRC Advisory Committee (WAC) created to provide the FCC advice, technical support and recommendations relating to WRC-2003. WAC considers proposals from everyone except federal government agencies. (FCC's WRC-2003 home Web page is www.fcc.gov/wrc-03/.)

FCC Alphabet Soup

EB—Enforcement Bureau
IB—International Bureau
NOI—Notice of Inquiry
NPRM—Notice of Proposed Rule Making
OET—Office of Engineering & Technology
R&O—Report and Order
PS&PWD—Public Safety & Private Wireless Division (WTB)
S&RD—Satellite and Radiocommunications Division
WTB—Wireless Telecommunications Bureau

The work of the WAC is divided into Informal Working Groups (IWGs) to gather information and develop recommendations on specific issues. In the case of WRC-2003 preparation the IWGs are, namely:

- 1 IMT-2000 and Terrestrial Wireless Interactive Multimedia
- 2 Mobile-Satellite Service including GPS
- 3 Fixed-Satellite Service / Broadcasting-Satellite Service
- 4 Fixed Service / Fixed-Satellite Service Sharing
- 5 5 GHz, 13.75-14 GHz and Maritime Issues
- 6 Public Protection and Other Issues
- 7 Regulatory Issues and Future Agendas

Nearly all agenda items of interest to the amateur services are assigned to IWG-6 and fall under the not-so-glorious category of "Other Issues." Amateur agenda items include Articles S1, S19 and S25, 7 MHz, digital broadcasting, and adequacy of broadcasting bands between 4 and 10 MHz. Ireland was appointed as Vice Chairman of this group in recognition of his broadcasting and amateur service experience. ARRL is also concerned with some of the other IWGs, particularly if they are looking for spectrum anywhere near amateur bands.

Once a particular proposal is agreed at the IWG level, it is sent to the WAC for its approval. Rinaldo and Ireland have

been designated members of the WAC. The FCC itself can accept, modify or reject an industry proposal. If approved, an industry proposal then goes to NTIA and the Department of State. If it survives that review, it becomes a draft US proposal and can be given final approval by State and sent to Geneva.

At some time in the WRC preparatory process, a US delegation is formed and a head of delegation with ambassadorial rank is named. While the FCC's WAC preparations are open to the public, the delegation is a closed group. Rinaldo has been a member of US delegations to WARC-92, WRC-93, WRC-95, WRC-97 and WRC-2000. At least one of the ARRL TRO staff will be a member of the US delegation to WRC-2003. There will also be amateurs in other country delegations, and the IARU will be well represented.

CITEL

Over the past two decades, there has been renewed emphasis on regional telecommunications organizations. Many have heard of CEPT (European Conference of Postal and Telecommunications Administrations). In our region, the organization is the Inter-American Telecommunication Commission (known by its Spanish acronym CITEL), an agency of the Organization of American States (OAS). Nowadays, practically everything that occurs at the ITU-R CPM and WRC is pre-digested in all the regional organizations, and CITEL is no exception. CITEL has an assembly every four years, a permanent executive committee (called COM/CITEL) meeting annually and a variable number of meetings of its Permanent Consultative Committees (PCCs) I (Public Telecommunications Services), II (Broadcasting) and III (Radiocommunications).

COM/CITEL currently consists of representatives from the following countries: Argentina, Brazil, Canada, Colombia, Ecuador, Grenada, Honduras,



CITEL Executive Secretary Clovis Baptista (left) met in Washington, DC, recently with Jon Siverling, WB3ERA, of the Technical Relations Office, to discuss amateur issues. (Photo by P. Huguet, CITEL secretariat)

Mexico, Paraguay, United States and Uruguay. PCC.I acts as a technical advisory body within CITEL with respect to standards coordination, planning, financing, construction, operations, maintenance, technical assistance, equipment certification processes, rate principles, and other matters related to the use, implementation and operation of public telecommunications services in the Member States. PCC.II is the technical advisory body for standards coordination, planning, operation, and technical assistance regarding the broadcasting service in its different forms. PCC.III is the CITEL technical advisory body for standards coordination, planning and full and efficient use of the radio spectrum and satellite orbits, as well as matters pertaining to the operation of radiocommunication services in the Member States. Amateur issues typically reside within PCC.III. The CITEL Secretariat is located at the OAS headquarters in Washington, DC.

CITEL is the beat of Jon Siverling, WB3ERA. He is bilingual, maintains liaison with the CITEL secretariat, and regularly participates in PCC.III and COM/CITEL. This year he also attended a meeting of PCC.II to explain Amateur Radio's role in disaster communications and to further promote our 7-MHz issue to Region 2 broadcasters. Siverling also attends many other US preparatory meetings for ITU meetings and will participate in a meeting of WP 8D this year.

The CITEL Working Group to prepare for WRC-2003 is chaired by Marc Girouard (Industry Canada) and Paula Córdoba (National Communications

CITEL Alphabet Soup

CITEL—Inter-American Telecommunication Commission
COM/CITEL—Permanent Executive Committee
IARP—International Amateur Radio Permit
PCC.I—Permanent Consultative Committee (Public Network)
PCC.II—Permanent Consultative Committee (Broadcasting)
PCC.III—Permanent Consultative Committee (Radiocommunication)

Commission, Argentina) serves as vice-chairperson. Siverling is the Chapter 5 coordinator of this Working Group, which covers maritime mobile, amateur, amateur-satellite and broadcasting services in the MF and HF bands. WRC-2003 amateur issues found in Chapter 5 include Agenda Item 1.7 (Articles S1, S19 and S25) and Agenda Item 1.23 (7 MHz harmonization). This preparatory group met for the first time during the XVII Meeting of PCC.III, in Panama, March 5-9, 2001. This group will prepare Inter-American Proposals, or IAPs, that will be the regional input to WRC-2003.

Recently, IARU Region 2 President Tom Atkins, VE3CDM, Rinaldo and Siverling met with CITEL Executive Secretary Clovis Baptista at the OAS Headquarters, Washington, DC. Baptista is supportive of Amateur Radio throughout the Region. He continues to urge more administrations within the Americas to ratify the International Amateur Radio Permit (IARP).

IARU

The ARRL serves as the International Secretariat of the IARU. By direction of President Price and Secretary Sumner, much of the day-to-day support is handled by the Technical Relations Office, known also as the IARU Technical Office. Functions performed routinely include:

- ◆ Daily distribution of documents to IARU officials from international sources such as ITU, CITEL and other regional telecommunications organizations.
- ◆ Drafting of input papers to international meetings for approval of IARU officers.
- ◆ Participating in studies and drafting of documents related to IARU Administrative Council meetings.
- ◆ Development and maintenance of instructional material for the Amateur Radio Administration Course offered periodically by IARU overseas and yearly by ARRL in Newington. Providing instructors for these courses.
- ◆ Assisting the IARU in publications projects such as contributing to the drafting and editing of the ITU-D *Disaster Communications Handbook for Developing Countries*, to be published in 2001.
- ◆ Providing support to IARU displays at ITU TELECOMs and other international exhibitions.

Domestic FCC Matters

General Counsel Imlay normally takes



Rinaldo with Legislative and Public Affairs Manager Steve Mansfield, N1MZA.

the lead in ARRL representation before the FCC. After all, the FCC deals with regulatory decisions, and operates according to an adversarial process. Nevertheless, many of the Commission's dockets include technical aspects and are studied by the TRO. General Counsel and the TRO draft pleadings for review by ARRL officials. This review includes the Executive Committee, including close scrutiny by the President and Executive Vice President.

That's the formal relationship with the FCC but the informal dealings are many. These involve frequent telephone calls and visits to several Bureaus and Offices. TRO staffers are at the FCC several times each week on international or domestic issues. The result is that ARRL has good access to various components of the FCC and enjoys a professional working relationship.

Nearly everything that goes on internationally either starts or ends with consideration at the FCC. The ITU tends to deal only at the radio service level, for example simply allocating bands of frequencies to (say) land mobile. It's up to each country to decide how to use the land mobile allocations. The FCC usually divides the ITU services into narrower domestic services. In the case of land mobile, it treats public safety and other dispatch radio separately and assigns different frequencies.

At present, Ultra-Wideband (UWB)

(ET Docket No. 98-153) is a hot issue. The ARRL is involved in both legal and technical studies to minimize the amount of interference from UWB to amateur systems operating in UHF and SHF bands, ie, 300-3000 MHz and 3-30 GHz, respectively.

The TRO is also participating in the work of the ARRL Board committee on Spectrum Strategy. Progress has been made on characterizing the problem of the influx of low-power (Part 15) devices in our bands above 420 MHz. Study is underway to develop a test plan, to be conducted by radio amateurs, to augment the noise studies recommended by the FCC Technological Advisory Council.

Routinely, the FCC circulates notices of proposed experimental licenses, many of which intend to use amateur bands. Normally, this is not a problem because of low power or infrequent use in a specific geographical area but the ARRL needs to watch them. Occasionally, as in the case of the use of the 2400-2450 MHz band by police in the Los Angeles area, harmful interference is observed, analyzed and reported to the FCC.

Conclusion

The ARRL's TRO may not be too visible within the amateur community, but is an important part of the action in Washington and internationally. **QST**

From May 1941 QST

