

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of  
Emergency Communications by  
Amateur Radio and Impediments to  
Amateur Radio Communications

GN Docket No. 12-91

*Comment*

by John A. Carroll W1PK

***Introduction***

I first heard of this inquiry late last week, when it appeared in the house journal of an EMC and product safety compliance laboratory. If the Commission will accept a late-filed comment into the record, I would like to add a few points the other commenters didn't raise, and expand on a few they did. Otherwise, while I largely endorse what others have said, I see no need to reiterate their remarks.

I was first licensed in 1957. My primary interest in ham radio for the past 35 years, aside from rag-chewing on the repeaters during commute time, has been public service and emergency communication in the VHF and UHF bands. I served in the Blizzard of '78, four lost child searches, the Lynn fire, many parade and road race communication support operations, and various roadside accidents and breakdowns. I was a member of the Minuteman Repeater Association's Public Service Committee for many years, and am presently active in Hillsborough County Amateur Radio Emergency Service.

***Original remarks***

**Specific benefits of amateur radio in emergency operations**

A key feature that ham radio brings to the mix of emergency and public service communication services is versatility and continent-wide interoperability. Because hams are required to pass an examination that demonstrates basic competence as a radio operator, it's possible for us to have equipment isn't crippled in the way that most units for the land mobile services are. Since the arrival of frequency-synthesized VHF/UHF transceivers in the late 1970s, any transceiver can be set to any legal frequency and repeater access tone from the front panel. This means that any unit can communicate with any other in the same band, or through any repeater, without crystal changes or the intervention of a service shop; the operator can do it in the field at any time, in some cases while mobile in motion. All that's needed is a published repeater directory and a list of net frequencies.

This enables ham radio to be the glue to connect agencies together when their own radio systems are mutually incompatible and geographically inflexible. Similarly, it allows us to assemble a communication support team from whoever is available, without concern for where they come from or what organizations they belong to.

By the same token, the technical qualification required of Amateur operators means that most of us can manage temporary repairs, improvise antennas, and otherwise deal with equipment problems at

need. Simple problems encountered while deploying for an emergency or public service job don't have to await outside assistance.

## **Applications of amateur radio**

The Commission asks how amateur radio is being used for emergency communications. In New Hampshire, official emergency planning involving ham radio largely centers on inter-city communication between emergency operating centers at all three levels of government (state, county, and municipal) when common carrier systems are out of service. For example, during the October 29, 2011 snowstorm the town of Wilton was cut off from outside communication and needed supplies and equipment from the state. During the first several hours, the only way the town government could communicate with the state EOC in Concord was to send a police car with a message from within the coverage footprint of police radio to the coverage footprint of the nearest working cell phone tower, driving back and forth. To solve that bottleneck, they requested communication support. A ham from Hollis, two towns away, set up at the Wilton fire station and provided communication with the state and county VHF nets for two days.

Most failures of commercial communication infrastructure in this state are caused by widespread heavy wet snow or ice storms bringing down tree limbs on wires, or occasionally summer lightning damage. Generally four or five towns at a time are affected, with several hundred line faults each and widespread street blockages; sometimes neighborhoods are isolated from the main roads. Power goes down first, followed quickly by wired telephone, cable TV/Internet, and cell phone service. Clearing street blockages typically depends on the availability and workload of power company trucks, since downed trees and limbs are usually enmeshed in tangled power wires; communication restoration has to wait until the roads are opened. Typical outages last 2 to 6 days, with the last restorations sometimes taking a couple of weeks.

The majority of town EOCs and hospitals in southern New Hampshire have permanent 2 meter antennas on their commercial towers, and many of these have 2 meter transceivers with the state's ARES frequencies set in memory. Most of these are FM; some have digital adapters to pass text messages using laptop computers with sound cards and open source software. Hams sometimes prefer to bring their own gear, which they use every day and are familiar with, plugging into the EOC antenna. Some EOCs have commercial transceivers in public safety bands with inter-city capability, but because they're rarely needed, they're not maintained and the agency personnel aren't trained to use them. Many aren't connected to antennas or power. The one I saw at the Hollis EOC was in a closet. If town-owned ham-band equipment fails, it's less of a problem, because there's enough personal equipment to fill any gaps. As long as the repeaters stay up, we can manage in a pinch with hand-held transceivers; if not, we rely on mobile rigs running from AC power supplies.

The statewide net uses NVIS on 40 and 80 meters; recent experience with poor propagation conditions on those bands has shown VHF to be more dependable, although it can lead to more relaying between regional nets.

Scheduled ARES training in this county focuses mainly on formal message-handling. We regularly provide safety and logistic support communication for foot races over courses several miles long, giving us practice in rapid tactical communications.

A good many New Hampshire hams participate in SKYWARN, reporting through local repeaters to the National Weather Service office in Taunton, Mass. There are local SKYWARN training classes.

## **Credentials**

I'm somewhat skeptical of the credentialism philosophy, especially the perception on the part of

some officials that only persons with official credentials should be allowed to help out in a general emergency. My experience is that if the core members of a communication support team set a good example of efficient operation, the rest will soon follow the procedures they hear on the air. Every year some of the volunteers for the Hollis half-marathon read the operation plan thoroughly, and some don't. Half an hour into the job there's little difference in performance.

### **Limitations attributable to FCC rules**

Some exceptions to the 1 KW limit might be considered. Moonbounce could potentially be a no-infrastructure long-haul alternative to HF when ionospheric conditions are marginal or worse, but the present power limit forces an uncomfortable tradeoff between signal bandwidth and antenna size. At 500W or so, data rates with moderate size antenna arrays amount to a few characters per minute. It's possible to exchange call signs that way and get a contact, but it's not sufficient for message traffic.

### ***Expansion on remarks of other commenters***

#### **Michael D. Adams**

In the past, certain rules in Part 97 were put in place to protect the revenue of commercial communication services from being bypassed by ham radio, which doesn't charge fees for handling messages or phone patches. Since the breakup of the AT&T monopoly and the rapid decrease in the size and cost of automated controls, technology that had been held back and kept from reaching the public for decades has become universally available, and pricing has declined to the point that there is little or no economic incentive to look for ways to avoid the commercial services. Nowadays even hams use the Internet to coordinate our activities.

Similarly, the incentive for commercial interests to misuse the Amateur Service for their own benefit has declined, and a good deal of spectrum is no longer attractive to commercial interests as they have replaced MF and HF systems with other technologies. Most of the pressure today is against the UHF bands and higher.

Portable, world-wide communication has not only become *available* to business and the general public, it has become *affordable*.

Therefore it's entirely appropriate, as Adams and others suggest, to review whether or not the reasons for some of the limitations in Part 97 are still relevant, or have instead become counterproductive to the public interest. In particular, limiting symbol or data rates appears questionable, since regulating only the signal bandwidths would be more to the point in sharing the spectrum space equitably between stations within the service.

His remarks and those of others on inter-service inter-operability are very interesting. This is a complicated enough subject to be worth an NOI on its own. Carefully crafted rules to allow back-to-back connections between ham systems and Part 15, Part 95, or Part 90 equipment could be very useful in some types of emergency or public event operations, with the ham networks providing the regional links. Gateways would be a key enabler in communicating between services on different frequencies, because that would allow multiple stations in the same service to hear each other directly while communicating cross-service; simply authorizing different services to transmit on their own frequencies and listen to each other is much less satisfactory, because while it facilitates two-station exchanges, it would be very clumsy for net operations. The main application of the latter mode of operation would be emergency reporting.

The possibility of adding a limited broadcasting privilege might also be examined. For example, the

two AM frequencies available for public announcements using low-power transmitters could be used to broadcast parking information at large public events such as air shows, with the reports coming from ham VHF nets.

A difficulty we in the Amateur service face in proposing specific revision to some of the older rules is that living memory doesn't reach back to their origins. The Commission is probably in a better position than anyone else to retrieve the original rationales for long-standing rules and publish their history in NOIs or NPRMs, so that there could be a rational discussion of whether they still fit today's world. In many cases, the records of long-ago proceedings may not exist anywhere but in the Commission's archives.

## **William F. Osler**

Regarding licensing and privileges: I concur. One of the major challenges today to the Amateur service's capacity to continue to serve as a flexible communications reserve, independent of vulnerable fixed infrastructure, is the shortage of new hams to replace those being carried off by old age. There's a lot of gray hair at any radio club meeting. Anything that discourages newcomers from entering the hobby or staying active is harmful.

For the past 30 years or so, the Commission has been gradually rationalizing the rules, after the unfortunate results of the 1963 incentive-licensing changes became evident. Even if that situation hadn't happened, the growing availability and declining costs of long-distance phone service, cell phones, the internet, and many new forms of entertainment would almost certainly have had an effect on interest in amateur radio by the 1990s. At this point, neither we nor the agencies and organizations that expect to call on us can afford to have arbitrary obstacles or "hoop-jumps" built into the rules. It's time to finish what has been started, and change the regulatory philosophy once and for all so as link privileges firmly to the technical qualifications necessary to exercise them responsibly. It no longer makes sense to withhold access to particular sub-bands or modes in an effort to push new hams to take a sequence of increasingly difficult exams. "I had to go through it fifty years ago" is not a sound reason to continue outdated rites of initiation.

If the Technician level exam is sufficient to qualify an applicant to build and maintain a network of automatically controlled repeaters and remote bases, I find it difficult to explain why it's insufficient to exercise any other privilege authorized for the service. On the other hand, the fact that there's an examination at all acts to discourage anyone completely unwilling to learn the technology, rules, and practices necessary to become a qualified radio operator.

Osler's and Don Rolph's remarks on encryption deserve careful examination, especially with HIPAA considerations entering the picture. The record behind putting this prohibition into the rules should be reviewed; that could be the subject of a separate NOI. Personally, I have no idea why this rule exists, and prefer not to guess; I wouldn't venture to propose a specific revision until the original purpose is made clear.

He mentions the rising noise floor from electronic devices of all kinds. Most repeaters in New Hampshire and eastern Massachusetts have been forced to install tone access because of the high level of broadband interference in the VHF and UHF regions; this greatly complicates transceiver setup. In the last year as LED traffic lights have come into use I've noticed intense VHF interference in a footprint a hundred yards or so wide around many of these installations, causing dropouts in mobile communication while stopped at a light. It may be appropriate for the Commission to investigate whether RF emission standards for these installations are adequate, or are being adequately enforced.

## **Burt Fisher**

While it's a tautology that advocating for one's own interests is inherently self-serving, that's not an argument against maintaining a vigorous Amateur service. Indeed, in a democracy, citizens are expected to intervene in public issues that affect them; nobody is responsible to do it on their behalf.

Thomas Jefferson famously wrote, "We hold these truths to be self evident, that all Men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the Pursuit of Happiness—That to secure these Rights, Governments are instituted among Men, deriving their just powers from the Consent of the Governed..."

Participating in a challenging hobby such as ham radio is, among other things, a classic example of the pursuit of happiness.

While a general right of privacy isn't stated explicitly in our constitution, the right to be let alone in one's peaceful pursuits is very much a part of this nation's fundamental political philosophy. We govern by majority vote, but we also protect the rights of the individual against the arbitrary tyranny of the majority. To countenance the use of a monopoly power created by large-scale real estate development as a coercive hammer to deny homeowners the right to use their private property as they wish is deeply repugnant to the principles on which this country was founded. Many of the rules and impositions of these so-called voluntary covenants are beyond the authority of the Commission to mitigate, but the implicit or explicit prohibition against transmitters and antennas on private property is not.

## **Martin D. Wade**

Regarding participation by paid employees of public and private safety organizations in training and exercises involving ham radio: perhaps a better standard than a specific maximum duration for test and training activities would be "reasonably necessary to maintain the intended emergency capability."

As Wade and others point out, the more often equipment and procedures are used, the more likely they are to be there at need. The most dependable ham-band gear is what the hams use daily for ordinary purposes.

## **Wireless Telecommunications Bureau/ Mobility Division**

It's understood that the purpose of this docket is to collect input to be used in a report to Congress. Clearly, that purpose has been achieved.

If Congress is contemplating legislation to preserve and promote the emergency capability of the Amateur service, as appears to be the case, the Commission is now in a position to compile the desired report. In view of what's in this record, it's important that any such legislation should be crafted in such a way as to protect hams from being financially ruined by abusive litigation in defiance of the law's intent.

## **Robert Witte**

On emissions: I concur. Enumerating the allowed emission types is an unnecessary obstacle to the natural evolution of ham radio technology. A new approach is needed to differentiate between what's consistent with the nature of the service and what isn't.

## **Gerald W. Murray**

Regarding interconnection with other services, I concur that it needs to be approached with caution, but the possible benefits make the effort to explore this topic worthwhile. In the VHF and UHF

regions, gateways are probably the most useful implementation. Rules for limited cross-service licensing or operation would be another approach to explore and analyze.

In the past, emergency autopatches on ham repeaters were common. With the spread of cell phones, most repeater groups have dropped their phone lines to save money. Unfortunately, this leaves only the type of common-carrier emergency reporting capabilities that are dependent on vulnerable commercial infrastructure. There are a few repeaters with direct links to public safety dispatch centers; any rule changes to make that easier to do without pushing the limits of the letter of the law, and with little or no special hardware, would be worth looking into.

### **Steve Porter**

If inter-service frequencies along the lines he proposes can be found, which is a distinct possibility, rules governing equipment specifications for all the services authorized to use those frequencies would need to be adjusted so that the manufacturers would design and configure the radio equipment to be capable of using those frequencies out-of-the-box. With so much of the newer radio equipment being microprocessor-controlled, with band limits hard-coded in firmware and no design documentation available to owners, it becomes extremely difficult to reconfigure newer equipment in the field.