

## “PART 15?” OR “DEATH OF THE RF SPECTRUM” AN EDITORIAL BY JAMES WADES (WB8SIW)

As this issue of “QNI” is being prepared, your editor finds it necessary to sit at least ten feet from the radio, otherwise, the RF noise generated by the laptop computer masks the powerful 50-kW clear-channel AM station being listened to. Even at a remote camp in Michigan’s Upper Peninsula, nearby power lines radiate a broadband noise, which appears to be some form of high-speed digital “hash,” making AM reception without a high-quality loop antenna difficult at times. Furthermore, the AC adapter that powers a cellular repeater at the cabin generates a loud hash that appears at different locations throughout the broadcast band; an interference suppression project to be attacked in the near future.

The number of unintentional radiators seems to increase almost daily. From marijuana grow light operations to computer networks and simple CFC lamps, the level of RF pollution is becoming almost intolerable in some areas. Add to this an ever increasing RF noise floor due to the number of new wireless devices being developed, and one has a recipe for the ultimate degradation of the RF spectrum and perhaps even elimination of many traditional RF-based services, perhaps to the detriment of public safety.

The impact is not limited to just the AM broadcast spectrum or Amateur Radio frequencies. It seems reasonable to assume that critical services, such as public safety, aviation, railroad communications and train-control, and similar life-critical systems are also being impacted. While it may not always be obvious to first responders using newer digital voice protocols, increasing RF pollution is likely impacting the performance of their

### VOLUME 6, ISSUE 2

#### In this issue:

Death of the RF Spectrum	<b>1</b>
National SOS Radio Network	<b>2</b>
On Blind Messages	<b>6</b>
Why don't we use our own system?	<b>8</b>
Comments on Radiogram ICS213 Forms	<b>8</b>
The Hallicrafters SX-28	<b>9</b>
Improvements to the Digital Traffic Network	<b>11</b>

### Special “Hamvention” Issue

RRI Frequently Asked Questions	<b>13</b>
Upcoming RRI Emergency Exercises	<b>15</b>
Dayton Hamvention	<b>15</b>

## QNI MISSION STATEMENT

QNI is dedicated to promoting genuine emergency communications preparedness.

Our newsletter is independently published and distributed free of charge to the Amateur Radio and emergency management community. The opinions contained herein do not reflect

the policies or opinions of any particular net or emergency communications organization.

Our mission is to provide a forum for EMCOMM volunteers throughout North America. We operate on the premise that Amateur Radio public service volunteers should

be, first and foremost, communicators and technicians.

If you share this vision, please support QNI. Submit your news and articles for publication.

## Part 15 Continued

hand-held radios and other life-critical communications equipment. For example, consider the number of unintentional radiators in a large office building or school complex and their potential impact on important communications functions during a critical incident, such as a school violence episode, fire, or terrorist incident.

So where is our government in all of this? For all intents and purposes, the enforcement of Part 15 has been abandoned in the interest of corporate profits. The less profitable concept of egalitarianism and equal access to the marketplace, public safety, and the future evolution of RF based technologies hold a distant second place to the power concentrated in a few large corporate organizations with the capacity to influence the regulatory agenda through the judicious allocation of sizeable campaign funds and other behind-the-scenes intrigue. Within the body economic, as the level of concentration within an industry increases, the ability to influence legislation is likewise greater. At the risk of sounding blunt; public safety organizations, independent broadcasters, and radio amateurs lack the resources necessary to purchase a congressman or senator. The reality of the Part 15 problem is decidedly political and politics can only be fully understood if one follows the money.

If there is a chance for solving the looming RF pollution crisis, it may be for multiple organizations to create a working group of motivated, highly qualified individuals charged with the responsibility of creating real public awareness about this issue. Such a group might consist of independent broadcasters, APCO, IEEE, emergency services agencies, our national amateur radio organizations, and similar advocacy and engineering associations. Public awareness could start with a systematic collection of data through RF surveys, the aggregation of complaints about interfering products, and the production of a readily available documentary designed for public consumption, which shows how RF pollution is impacting existing wireless services, public safety and broadcast services.

The regulatory goals of such a group could be clearly defined. For example, any device capable of emitting unintentional RF energy would be required to meet stringent requirements before it could be imported from overseas. Organizations, such as fast-food restaurants would be held responsible through class-action lawsuit for unintentional RF energy, which degrades public safety, two-way radio, or broadcast reception at drive-through windows or within parking lots, and so forth. Political goals would include sufficient funding to allow the Federal Communications Commission to engage in Part 15 enforcement. With hundreds of thousands of products and businesses totally ignoring Part 15, such enforcement would likely pay for itself or even turn a profit for the US Treasury through the collection of appropriate fines. Finally, it is essential that we, as voters, follow the money. This is ultimately the key to understand, and correcting, bias in the political and regulatory process.

## National SOS Radio Network

Adopted by Radio Relay International Board of Directors

*- An Introduction to How it Works -*

The Radio Relay International Board of Directors has adopted the National SOS Radio Network as a community outreach program. Founded by Eric Knight during the aftermath of Hurricane Katrina, the National SOS Radio Network leverages simple, affordable GMRS and FRS radio assets to improve emergency response during major disasters. The RRI Board envisions the National SOS Radio Network as a program designed to achieve a number of purposes:

1. Local community organizations active in disaster and emergency response can build customized local networks around FRS/GMRS equipment to facilitate operations in the field. A local RRI Amateur Radio volunteer can then provide a messaging gateway to local emergency services and, of course, the RRI national messaging layer for origination and delivery of health and welfare traffic or other operational message traffic. Organizations supported might include CERTs, SAR organizations, scouting groups and even neighborhood associations.

2. Many families possess simple FRS radios. These radios are often used during camping or hiking excursions, at stadiums and large public events, or while caravanning on the highway. The default channel one can be used for summoning assistance in the absence of cellular or land-line telephone service after an earthquake, hurricane or other major disaster. RRI and other EMCOMM volunteers with high-profile UHF antennas can easily cover a nearby area to monitor for 9-1-1 assistance calls in the absence of traditional telecommunications infrastructure. Appropriate Public Service Announcements can provide guidance to the public for using the service.
3. The National SOS Radio Network can be integrated with our scouting outreach program. A local troop can obtain RRI training on basic radio communications, the application of proper radio procedures, phonetic alphabet and the like. Basic FRS/GMRS radios can be used for coordination during hikes, outdoor activities and community events. An RRI affiliated volunteer radio amateur can also provide a gateway to the RRI National Messaging Layer to provide messaging to family or emergency services during remote excursions or bivouac in areas where cellular data networks lack coverage.
4. The National SOS Radio Network allows RRI affiliated volunteers to interface with community organizations and, in the process, harvest situational awareness during major disasters. This allows an EMCOMM organization affiliated with RRI to “drill down” deeper into a community to gather situational intelligence during major disasters. Once harvested, such information can be verified, summarized and transmitted via both local nets and via the National Messaging Layer to served agencies, such as local and state EMAs or the Federal Emergency Management Agency.
5. The National SOS Radio Network can facilitate an initial exposure to the world of two-way radio communications for affiliated organizations. Because an Amateur Radio component is built into the program, there will likely be a certain percentage of individuals who will develop sufficient interest in the program to encourage the “step-up” to the Amateur Radio Service. This may be particularly true with the scouting-oriented component of the program. RRI plans to develop a tiered approach to scouting support, which includes Amateur Radio licensing.

Ultimately, the success of the National SOS Radio Network will be predicated on an effective organizational and coordination mechanism. RRI plans to appoint highly qualified State Communications Managers to supervise this outreach program. The State Communications Manager will work with local radio clubs, EMCOMM organizations and similar units to facilitate the development of the program. A local community group, which chooses to participate in the National SOS Radio Network will be assigned a local volunteer (club) selected by the State Coordinator to serve as point-of-contact for the local community group. The local liaison will ensure that certain actions are taken. For example:

- The standardized RRI training is provided.
- The community groups are integrated into occasional emergency drills based on their scope of activity/community mission.
- Liaison is provided by local radio amateurs who are also willing to participate in RRI networks.

This can be better understood by examining a few hypothetical scenarios:

*Scenario 1: The Earthquake Event*

Joe Hamm, representing the Grass Valley Amateur Radio Club has been appointed by the RRI State Communications Manager to facilitate his club’s development of the National SOS Radio Network in his area. During the preceding year, Joe and his peers in the club have utilized the RRI provided training materials to develop local networks amongst several CERTs and SAR groups. All are now properly trained to utilize two-way radios. Some have installed higher power GMRS equipment in their vehicles. They are familiar with the proper prowords, the correct application of the phonetic alphabet, and basic messaging procedures. Meanwhile, several radio club members have joined local traffic networks to access the national messaging layer. They are likewise active in their local EMCOMM organization and equipped to interface with these local groups via a shared GMRS/FRS channel.

An earthquake occurs, which disables or overloads commercial telecommunications common-carrier networks. These CERT and SAR organizations are deployed to the field. They utilize their GMRS radios to communicate locally in the field.

On occasion, they need to send or receive a message to the local EOC or request emergency services for a disaster victim. When these situations occur, they contact the RRI or other EMCOMM gateway station who transfers their message to the local EOC or other emergency services agency.

As the disaster response evolves and the number of life-critical situations subside, several local volunteers encounter disaster victims who would like to contact family members to advise them of their status. Having been familiarized with the Health and Welfare capabilities of RRI, they take the contact information for the victim's relative, format a brief message using an ARL standard radiogram text, and transmit that information to the RRI gateway. The radio amateur serving as the gateway operator takes the message and injects it into the RRI national messaging layer for routing and delivery to the relative.

During this process, the RRI gateway volunteer can also distribute important information, such as the location of service centers and shelters, where to obtain food and medical assistance, road closures and the like. This is also a two-way street. Local community volunteers can provide information on utility outages, infrastructure failures, or other disaster effects, which can then be harvested, verified and the information transferred to served agencies for use as situational awareness.

In this scenario, one might view the National SOS Radio Network as a "force multiplier." Whereas there might be 50 or 100 active radio amateurs in a county, there might be hundreds of individuals active in various social service, relief and community organizations active in disaster response. Many of these organizations and individuals can afford basic 5-watt GMRS hand-held radios or 50-watt GMRS mobile radios. Several local radio amateurs can provide the higher-level infrastructure, which is naturally afforded by their license, local EMCOMM groups, and the RRI national messaging layer, thereby multiplying connectivity within the community.

#### Scenario 2: The scout troop

CW McHamm has been an active adult leader in a local scout troop for several years. As part of the troop's emergency preparedness mission, CW obtains a donation of a dozen FRS radios and two GMRS radios for use by his troop when in the field. The GMRS and FRS radios are interoperable due to a series of several overlapping channels.

Over a period of a year, CW provides the standard RRI training to the scouts and integrates two-way radio into their regular outdoor and community service activities. The scouts are encouraged to use disciplined, proper radio procedures at all times. Eventually, responsible two-way radio use becomes second nature.

Eventually, the troop plans a trip to a remote area. CW arranges for two local club members who are active in RRI to accompany the troop. These radio amateurs serve as a communications gateway for the troop. In the event of an emergency, they can take a message from the scouts via the FRS/GMRS channel and transfer it to local emergency services. In the evening, they send and receive radiogram message to/from the parents of the troop back home. In the process, demonstrate ham radio for the scouts, perhaps sparking an interest in ham radio.

Eventually, several scouts decide to pursue ham radio and CW assists them in their endeavors. These scouts eventually develop sufficient skills and knowledge of message handling procedures to perform the gateway function themselves!

#### Scenario 3: 911 Outage

A major 9-1-1 outage has occurred due to a contractor severing fiber optic cables along a railroad right-of-way. An area of approximately 72 square miles has been isolated from 9-1-1 service. The County EMA has activated its emergency plan. An EAS alert has been issued with an appropriate Civil Emergency Message. Likewise, public service announcements have been distributed to local broadcasters identifying municipal offices and fire stations at which requests for emergency assistance can be directed. However, this activation has a "twist." Thanks to an agreement with the local Amateur Radio Emergency Services (ARES™) group, the same PSAs mention that, where available, the local Amateur Radio volunteers will be monitoring FRS channel one for individuals who require emergency assistance. ARES members in the affected area immediately begin monitoring 462.5625 MHz (channel 1) and additional ARES volunteers are dispatched to the affected area to increase the density of monitoring points for incoming emergency services requests.

*A proven concept:*

The National SOS Radio Network has already proven useful in a number of situations, including forest fires out west and the like. Similar “stand-alone” programs have been developed at the local level. The integration of the National SOS Radio Network into Radio Relay International will greatly improve the effectiveness of these programs because RRI and affiliated local Amateur Radio clubs or EMCOMM groups can provide both local and national connectivity (infrastructure), thereby greatly multiplying the value of basic, inexpensive FRS and GMRS radios.

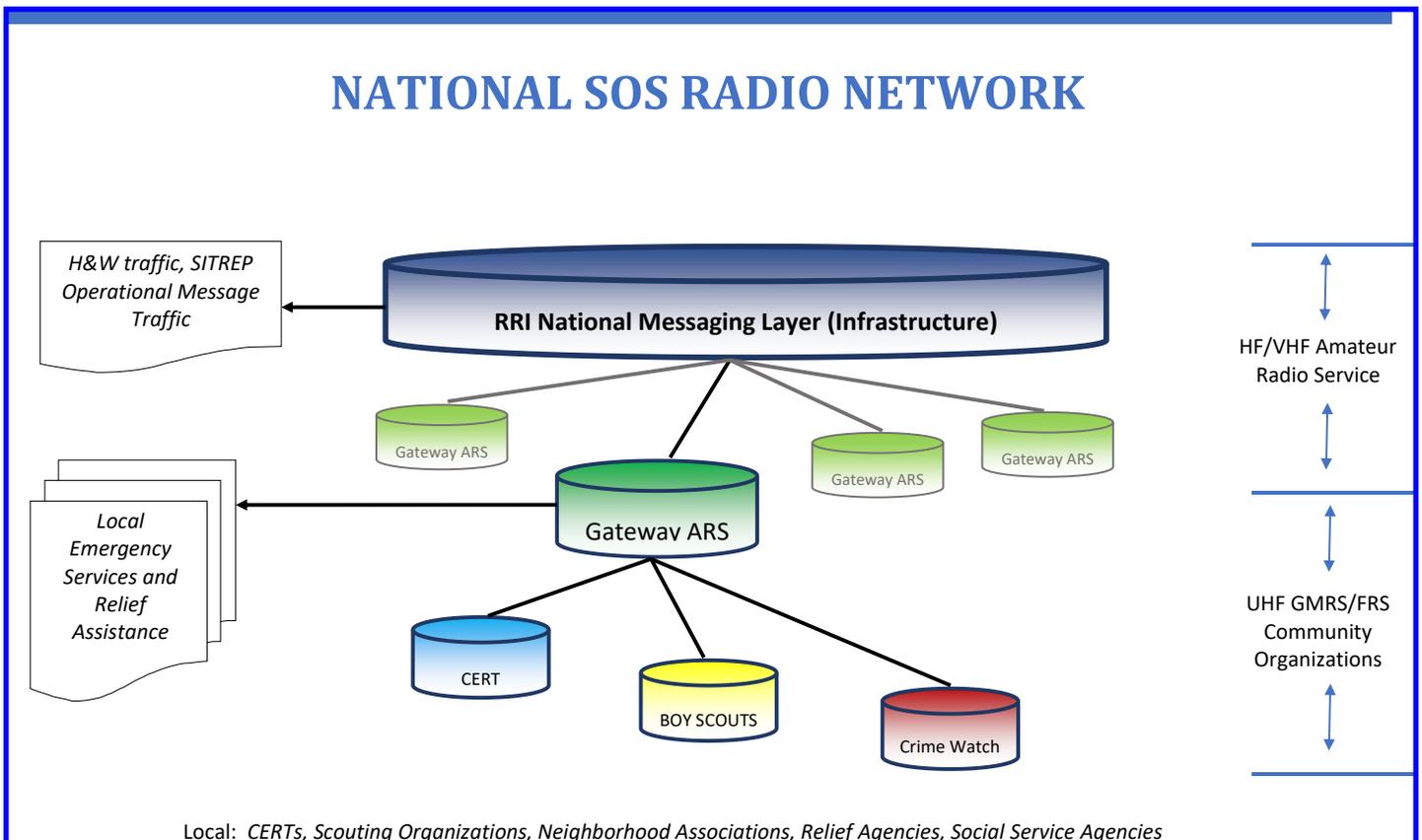
Ultimately, it may be the local community outreach, which has the greatest value. For example; consider the goodwill created when a radio amateur in a home-owner’s association organizes a network as part of earthquake or hurricane preparations. Consider the value of integrating basic two-way radio communications and message handling procedures into a scout troop’s emergency preparedness program and outdoor activities.

In the coming months, RRI will begin appointing State Communications Managers who will be responsible for promoting the program. These individuals will reach out to local clubs and EMCOMM groups to promote and expand the National SOS Radio Network. These local programs will have the flexibility needed to shape the program to local requirements. However, the one constant will be the presence of the Radio Relay International infrastructure program in the background. By integrating these small local networks with a national program and infrastructure, one can create an organic emergency communications program that can greatly aid the public. Radio clubs, EMCOMM organizations and community organizations (scouting, CERT, SAR, humane, religious, etc.) wishing to participating in the National SOS Radio Network program should send an e-mail to:

**info@radio-relay.org**

State “Participate National SOS Radio Network” in the subject line.

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Local: CERTs, Scouting Organizations, Neighborhood Associations, Relief Agencies, Social Service Agencies

## On Blind Messages

“Perils of the Delivery Guy”

By Fred “Skip” Jensen (K6DGW)

The days of stopping by the Amateur Radio booth at the County fair and dashing off a message to Aunt Emily that “WE ARE AT THE PODUNK COUNTY FAIR X HAVING A GOOD TIME X LOVE SMITH FAMILY” are pretty much over. OK ... they're really over. Handling traffic using Morse code in the manner of the 20<sup>th</sup> Century maritime and point-to-point HF systems is an anachronism in 2017 [until a major disaster occurs—Editor]. However, many of us enjoyed it early in our ham careers, some of us even commercially, and we still enjoy doing it, anachronism or not.

The current [and perhaps only] solution to lack of “real” traffic is to generate what amounts to “test traffic” and introduce it into the network. One method has been to mine the FCC database for new hams and send them a congratulatory message. Recent renewals, approaching expirations, and just plain “practice messages” have been added.

This works very well within the networks. Because new hams are appearing all over the country as clubs hold classes and VE sessions, the entire network gets some exercise. Neither the originating stations nor the recipients know each other, but while traversing the network, that is irrelevant ... they're messages, and we exercise our procedures to move them along. Until, of course, it reaches the last station in the network ... the “Delivery Guy (DG).” Here, the situation changes dramatically.

I am basically “the” DG for Northern Nevada [area code 775]. A fraction of the phone numbers are bad, either not a working number or someone else's number. A smaller but still significant fraction will be answered by a woman who, when asked to fetch the new ham to the phone, caustically replies, “He doesn't live here anymore” and hangs up.

The DG has a short period, usually measured in tens of seconds, to convince whoever answers that, “I'm not a robot, this is not a sales call, there are no timeshare condos involved, I'm not after social security numbers, and I have no connection with politics or religion.” Past that hurdle, the new ham might be there to get the “Congratulations on your new license” message. It's almost always well received and usually results in a chat.

The others ... not so much. “Thanks for renewing” often elicits responses that could be paraphrased, “Why do you care? Good bye.” The “Your license is about to expire” message won't make it past my Delete key. I've delivered three to widows, the last a young woman whose Marine had been killed in Afghanistan a couple months earlier. Neither she nor I needed that, and I really don't care if you've checked the SSDI. Figuring out if a stranger is alive or dead has the same accuracy as predicting the weather for next Thanksgiving.

I guess it's just the current state of our culture, but the “Please consider joining a net” message is generally received negatively. The responses differ but all seem to fall into the category, “What? This guy I don't know is telling me how I should do ham radio?” If it's addressed to a Technician licensee, which many are, I just QTA since Techs don't do HF. I also QTA the “Practice Messages.” They make no sense to the intended recipient [or me], I'm taking up his or her time, and I'm not making ham radio look good.

All but the new ham congratulatory message have completed their missions [exercising the network] when they arrive at the DG's station. There is no rational reason why any of them should actually be delivered to the guinea pig in the address block. That takes up his/her time and accomplishes nothing additional for the traffic network. You, the originator of the message don't know this person and have no interest in whether or not it was ever delivered.

**A Proposal:** Define a new handling instruction, “HXN” [No delivery]. Use it on all the test messages. When the DG gets it, he initiates a receipt report back to the originator with date, time, and QTH of receipt and files both. This doubles the traffic to exercise the network, and offers the DG's, who otherwise are just test message sinks, the opportunity to originate

and send traffic. No one is being inconvenienced with phone calls from strangers.

Along with this proposal, I suggest we agree that every test message will be complete with a text block and dispense with “canned” text blocks which we find on the Internet. The mission of test messages is to exercise the elements of the network and getting the entire message correct is part of that. Besides, the advent of the Internet is what eliminated our “real” traffic in the first place. 😊

The originator has no idea at which DG station the test message will end up. But, when the HXN message gets to whatever DG station it is routed to, the DG becomes the effective addressee. This opens the possibility of some additional fun. Consider:

```
1234 R HXN K6HTN 11 PASADENA CA APR 28
JOSEPH J HAMM K7XYZ
4321 STOCKMAN ROAD
LOVELOCK NV 89421
BT
A CALCULATING DEVICE USED BY ENGINEERS BEFORE THE COMPUTER
WAS INVENTED
BT
KATE K6HTN
AR
```

Assuming I'm the DG which is likely in this example, I will reply:

```
4 R K6DGW 10 SPARKS NV MAY 1
K6HTN
PASADENA CA 91104
BT
YOUR 1234 X A SLIDERULE X I STILL USE MINE
BT
FRED K6DGW
AR
```

I don't need Kate's full address because she'll get my reply from SCN (but the zip code is important for digital transfer). And, note: no one has to look up phone numbers. The questions might be taken from crossword puzzle clues, or perhaps Jeopardy. Sending scrambled words to be unscrambled could also be fun but might run afoul of 47CFR97.113(a)(3)(iv) (4).

At the least, adopting this proposal will eliminate bothering [and likely annoying] strangers with essentially meaningless phone calls, and it will make the life of the Delivery Guys much less stressful.

73,

Fred (“Skip”) K6DGW  
Sparks NV DM09dn  
Washoe County

Editor's Note: Fred offers an interesting perspective on a potential method for further exercising the network. While your editor sees this as a potential method for further exercising the system, we should still seek meaningful ways to exercise the system by generating real traffic of value. Delivery practice is also important. In particular, the new National SOS Radio Network program and scouting outreach may achieve the goal of generating additional “unique” traffic. Nonetheless, should we give Fred's proposal a try? Please submit your opinions to the editor of “QNI.”

Assistant Editor's Note: Have a look at the trivia questions available on the very underused site:

<http://ntstalk.wikidot.com/activity:trivia-traffic>

## Disuse Atrophy or Why don't we use our own system?

*By James Wades (WB8SIW)*

Traffic nets are always seeking business. Message traffic is the lifeblood of any communications network. If we are to be prepared for disaster situations, which, although very rare, may require our resources, it is necessary that we practice.

It seems a shame that so much of our Amateur Radio business is conducted over commercial networks. This is a bit ironic. After all, Amateur Radio is supposed to be the option for those situations in which “all else fails.” Yet, our Amateur Radio affairs are typically conducted using e-mail and cellular data networks. When one stops to carefully consider this situation, the irony becomes obvious.

Does it not make sense to use our own Amateur Radio Service networks for as much internal communications as possible? For example, monthly EC reports, station activity reports, and similar business could all be transmitted via an Amateur Radio network. Amateur Radio clubs and organizations of a national scope could certainly use traffic nets to advantage. When someone joins FISTS, a contest club, a QRP association, or the like, it only makes sense that the organization would acknowledge the new member with some type of message. By originating a radiogram with full contact information (perhaps including e-mail), a professional, pleasant message delivery can occur. Such message deliveries build connections. These spontaneous connections build a sense of community. A sense of community strengthens the fraternal foundation of Amateur Radio.

If we can't use our own networks, then why does the Amateur Radio Service exist? Do we exist so that a few oldsters can chat about their “regularity” on 75-meter phone? Do we exist so that a few hams can exchange cookie-cutter QSO information on 40-CW? The wise man would answer “no.” We exist to advance the radio art, improve international relations, train operators and provide emergency communications when necessary. By using our networks whenever practical, we fulfill our purposes by training operators and developing our EMCOMM capabilities.

Consider this a call to our leaders in Amateur Radio to consider using RRI and other EMCOMM networks for our internal business whenever practical. By doing so, the demand will stress these systems in the same manner that lifting weights or running stresses the athlete and ultimately improves his fitness. The result of such stress is growth, development and rebuilding.

Next time you're about to submit that monthly report or welcome note via e-mail, why not inject it into the RRI system or send it to an operator who can? By doing so, you build the body of our EMCOMM networks and improve connections in the Amateur Radio community.

Send a radiogram today!

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## Comment on the Radiogram ICS213 Message Forms

*By Steve Hansen (KB1TCE)*

### **Feedback on the Radiogram ICS213 Forms:**

We had a county-wide exercise on April 29 that centered on formal messaging. This gave us a chance to use the Radiogram ICS213 format as defined in *RRI Form 1702-ICS*. We moved several messages between Matinicus Island and the county EMA by voice. It worked very smoothly and having the preamble and routing info on the form was quite useful, even in this local setting.

On the form, I would remove the “(optional)” from the “subject” block. In the FEMA form it's not optional. It also gets in the way of the written entry. I've also commented about the “Local Time” block. I think it should just be “agency origination DTG.”

73, KB1TCE

## **Response to Steve:**

Based on Steve's suggestions, we have modified the RRI Radiogram ICS213 Message Forms 1701 through 1704 accordingly. The nomenclature for these forms remains the same. However, the modified forms indicate the date of May 1, 2017 under the RRI Form number.

For those unfamiliar with the forms, they can be described as follows:

**RRI Radiogram ICS213 Form 1701-ICS:** A simple form designed for printing in quantity *prior to use*. Form 1701 has a larger blank area for typing the message text using a typewriter (mill) or word processor program and printer.

**RRI Radiogram ICS213 Form 1702-ICS:** A simple form designed for printing in quantity *prior to use*. Form 1702 is identical to the above form, but it has 50 blank lines, which can be populated using pen or pencil. This form is ideal for use in situations in which one might need to fill out an ICS213 during field operations using a pen or pencil.

**RRI Radiogram ICS213 Form 1703-ICS:** This is a fillable form designed for direct use on a computer. The fillable portion of the text area is of open architecture, allowing for variable word count on each line. Furthermore, the text space is not limited to 50-words.

**RRI Radiogram ICS213 Form 1704-ICS:** This is similar to the above form 1703, but the fillable text portion consists of 50 blank spaces, which encourage a brief message text while facilitating a rapid group count (check calculation) for the operator.

Each form includes a set of brief, concise instructions on the back, which should aid those operators unfamiliar with harmonizing the radiogram and ICS213 message formats. All four Radiogram ICS Forms are available at our "Files" section on the RRI "yahoo group." They will also be available at our web page and upon request as e-mail attachments. In the latter case, to request the files send an e-mail to:

info@radio-relay.org

We would like to hear more from users of our Radiogram ICS213 Forms. Please submit your experiences to the Editor of QNI.

## **The Hallicrafters SX-28 Receiver**

*By James Wades (WB8SIW)*

Many years ago, while working as a broadcast engineer at a small station in Ann Arbor, Michigan, I had the good fortune of inheriting an old Hallicrafters SX-28 receiver for use in the engineering office. Undoubtedly, the receiver had been there since the station went on the air shortly after World War Two. Not only did the receiver make an excellent broadcast monitor, it also proved useful for checking harmonics and the like to better ensure the proper operation of the Collins 21-E transmitter at the remote site.

On occasion, I would tune in an interesting shortwave station, preferable one transmitting five-letter cipher groups or perhaps an Amateur Radio or Military CW net and listen-in while working. On occasion, an employee would ask "what are they saying" I would then translate the code and he or she would leave impressed that I could translate the series of seemingly meaningless "dits" and "dahs" emerging from the speaker. One young newswoman was thoroughly convinced I was a

“spy.” I suggested that I wasn’t paid sufficiently for such service, but then again, Ann Arbor likely offered numerous opportunities to discover individuals of communist persuasion at the local university, which was at the center of “Moscow on the Huron.”

One of the impressive features of the receiver was its audio output stage consisting of push-pull 6V6 vacuum tubes combined with a bass-reflex external speaker. A switch on the front panel enabled “bass boost,” which, when engaged, provided a rich, compelling sound on AM (“standard”) broadcast stations. The warm glow of the dial added a pleasant accent to the office when working past sunset during those short winter days.

Eventually, I moved on to bigger and better things, leaving the small-market broadcast stations, and the SX-28, behind. I hope it ended up in good hands.

Recently, I impulsively answered a classified advertisement offering an SX-28, fully restored at a reasonable price. Nostalgia is a powerful thing, so I made arrangements with the seller to drop off a bit of cash in exchange for the receiver. I wasn’t disappointed. It was not only clean, but the restoration had been well done. It now resides in a place of honor in the ham shack and, while not used actively on-air, it does a fine job of receiving sports broadcasts and the occasional AM station that still offers decent music programming.

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*The Hallicrafters SX-28 was introduced shortly before World War Two. This receiver saw significant application in various intercept operations. The receiver is perhaps best known as a mainstay of the Federal Communications Commission’s Radio Intelligence Division, which utilized it at both monitoring stations and in mobile installations to triangulate and identify the location of clandestine radio transmitters operating within the United States during World War Two.*

# Improvements to the Digital Traffic Network Part One

By James Wades (WB8SIW)

The recent Cascadia Rising disaster exercise revealed the truth about traffic networks: Our national messaging layer not only has the capacity to support important agencies, it can do so in a highly professional, competent manner. As a matter of fact, our “Cascadia Rising” results, while completely ignored by the so-called Amateur Radio “news” organizations, nonetheless proved an embarrassment to those who repeatedly, and very publicly, dismissed the former National Traffic System and traffic nets in general as irrelevant.

Like all properly designed emergency management exercises, the framework of the Cascadia Rising event was designed to test the capacity of the national messaging layer to respond to a disaster situation in an accurate and timely fashion (more details may be found in back-issues of “QNI.”). The exercise was also designed to expose any potential weaknesses within our network. In this respect, “Cascadia Rising” revealed several areas requiring improvement, which should be considered going forward:

1. A greater density of region hubs is recommended.
2. Additional alternate area hubs are recommended.
3. The presence of an attendant (sysop) at area hub stations during emergencies is recommended.
4. Area hubs (or alternate hubs) would benefit from access to directional antennas and amplifiers.

The hubs within DTN are generally designed for omni-directional service. During routine operation, an area hub station must accept connections from multiple directions. Therefore, the use of a directional antenna can be inherently problematic. Likewise, hub stations generally limit their power level to minimize interference to co-channel and adjacent channel operations. This standard configuration is more than adequate during routine traffic periods. However, Cascadia Rising revealed the need for a more robust approach. For example:

- When a major disaster occurs, one or more hubs could implement a response protocol requiring the use of a directional antenna and amplifier. Transcontinental traffic flow between area hubs might also require that intermediate hubs implement a similar procedure. Such a configuration might be requested by the RRI National Emergency Communications Coordinator.
- The attendant or sysop would likely be the hub operator. His job would be to monitor throughput during the disaster operation and ensure the hub is clearing traffic in a timely fashion. Because DTN is automated, his workload would be limited to periodic “quality control” checks to ensure that connectivity is present at all times, monitor the channel for potentially harmful interference, and the like.
- If interference is excessive from co-channel or adjacent channel users, a protocol for transitioning to an open frequency outside the automated sub-bands could be called for. This would require a downgrade in the PACTOR protocol and the presence of an attendant to monitor operation (per FCC rules), but it would also ensure uninterrupted traffic flow under worst-case interference conditions.

The latter recommendation was offered in response to the heavy use of WL2K by local and state ARES and AUXCOMM groups operating simultaneously during a widespread disaster simulation. For example, during “Cascadia Rising,” one observer compared the narrow automated sub-band allocations to a “RTTY contest” due to the high demand on WL2K facilities.

All of this points to the obvious: *Radio Relay International needs additional volunteers to support its DTN operations.* Our goal is a robust, diverse automated high frequency data network, preferably with robust VHF gateways in larger metropolitan areas or near other population centers. We need technical-oriented people with a desire to perform an important public service. We would also like to have a few high-profile stations incorporated into our infrastructure.

In recent years, our DTN and CW networks have expanded to incorporate our affiliated networks in Europe, Asia and Oceania. A high-profile contest station would be ideal for maintaining these links. For example, contest stations often sit idle much of the time awaiting the next “big event.” When the contest station is not being used, an automated DTN hub could be left in operation with a directional beam antenna pointed at a similar hub in Australia, Hong Kong, or the EU. When the contest station is being used by the club or contest group, the hub could be shut down for the weekend. The idea would be to ensure availability in the event of a major disaster, such as a Pacific region tsunami, typhoon or the like. This would be an excellent way for contesters to support a worldwide emergency communications network with a minimum of effort and without disruption to their occasional contest operations. Because DTN is fully automated, very little operator intervention would be required except to ensure an attendant is present for quality control monitoring during a major disaster. Routine operations are automated, so no regular operator intervention would be required.

While most hubs operate at a standard 100-watt power level, one need not upgrade hubs to 1-KW. A 500-watt amplifier could greatly improve connectivity at lower cost and with considerable ease of installation. A higher power level could be implemented under poor propagation conditions or when required to transfer traffic from a disaster area.

Finally, it is recommended that we work with local radio clubs and EMCOMM groups to expand the Digital Traffic Station (“DTS”) function and develop Digital Traffic Stations designed to better support local community operations. Access to the Digital Traffic Network is simple and affordable. All that is required is a computer with the correct software (free) and a simple PACTOR-1 modem. Throughout the United States and Canada, one can find numerous ham radio stations at EOCs, Red Cross Chapters and so forth, all of which generally sit empty for long periods. The better class of such stations could be easily set up to serve as DTN region hubs or simply “as needed” DTS stations to facilitate the process of injecting record message traffic into the national messaging layer in time of emergency.

Is your local ham radio club, served agency or school club station looking for something fun and interesting to do? Why not work with Radio Relay International to set up the station for DTN participation. It’s inexpensive and easy to do. A club could build a small team of operators interested in participating in our traffic networks. Such a program could also be integrated into our National SOS Radio Network, which could be an excellent outreach tool for interfacing with local community organizations such as scout troops, CERTs, SAR groups and the like into the club station project.

In summary; some goals for DTN might include:

- Improved region and hub station facilities.
- Greater density of DTN facilities.
- Greater density of DTS operators.
- Partnership with, and integration of, high-profile contest stations into our worldwide digital (and perhaps CW) networks.
- Partnership with local radio clubs to integrate their club station facilities into the RRI networks (DTN, voice and CW), as well as serving as a foundation for our National SOS Radio Network.

The possibilities for Amateur Radio public service communications are impressive. Unfortunately, past efforts have either been very narrow in scope or myopic to the point that they favor only one mode or mission. RRI offers affiliated organizations a **diverse, inclusive** approach that can appeal to a wide group of radio users, from CW or voice operators to the IT/digital enthusiast. There is even room for integrating and mentoring local community groups, with an opportunity to eventually develop these latter individuals into Amateur Radio Service operators.

Why not contact us for more information. Review the back-issues of the “QNI Newsletter” at: [www.qni-newsletter.net](http://www.qni-newsletter.net)

Contact us at: [info@radio-relay.org](mailto:info@radio-relay.org)

**Part Two will consist of a more formal article by Grant Hays (WB6OTS) and Peter Dintleman (DL4FN) highlighting recommendations for improvements intended to better facilitate an *International* traffic system.**

## Radio Relay International FAQs

*RRI receives numerous inquiries about our organization. Perhaps these responses to Frequently Asked Questions may prove helpful:*

**Q: Does RRI Interface with other EMCOMM and traffic organizations?**

**A:** Yes. RRI provides an open infrastructure designed to facilitate both routine and emergency communications. We will work with any organization active in public service communications. Our goal is to expedite the flow of record message traffic in a timely, accurate manner, regardless of which agency or organization originates it.

**Q: Does RRI compete with other EMCOMM or traffic organizations?**

**A:** No. It makes little sense to “re-invent the wheel.” Where there are effective local EMCOMM groups and networks, we recommend continued support of these organizations. There are many outstanding state (section) and local EMCOMM organizations and traffic nets ranging from various ARRL “ARES”™ units to RACES and the MARS organizations. Our goal is to cooperate with such groups in a constructive and positive manner whenever possible.

**Q: Our local traffic (or ARES, AUXCOMM, etc.) net would like to affiliate with RRI. Can we do so?**

**A:** Yes. First, it should be understood that net affiliation is NOT mutually exclusive. In other words, a net can be affiliated with another organization and be also affiliated with RRI simultaneously. *RRI is currently developing a detailed affiliation policy*; however, as a general rule, RRI affiliation requires that traffic injected into the system and usage of RRI infrastructure requires conformation with our basic guidelines.

**Q: “My state (section, province, country) does not have a traffic net” or “my state traffic net refuses to interface with networks outside its area.” Can I start a traffic net?**

**A:** Yes. We recommend that you start small and organize your net around a core group of people. You will need to be quite visible at ham swaps, radio club meetings and similar venues as you recruit new net members. You will need to have one or more liaisons (digital or otherwise) with the appropriate RRI layers. You may also want to look at consolidating with a nearby state net to minimize overhead until you are ready to “go-it alone.” When possible, you should keep the door open to cooperation with other public service organizations and Amateur Radio associations.

**Q: I read that RRI operates several voice and CW frequencies for traffic exchange and emergency response. Can I call an RRI station to chat?**

**A:** One can call “RRI” to test or conduct otherwise brief communications, such as asking for a signal report or the like. However, please keep your communications brief in order to avoid discouraging long-term monitoring. Occasional brief signal reports or inquiries are encouraged to familiarize operators with the RRI frequencies and propagation characteristics. Extended discussions or QSOs should move to an adjacent channel to complete their conversation.

**Q: Why should I participate in the RRI Tropical Storm Network (TSN) when I can report weather data via the Internet?**

**A:** This is a common question. First; the goal of TSN is to collect data from within the affected area. Our HF networks do not require access to vulnerable infrastructure to function. Consider the possible loss of Internet connectivity. Likewise, automated Amateur Radio networks, such as APRS, often require access to a nearby node, which is also vulnerable to storm damage or power loss. Second; participation in TSN stages networks and operators for transition into operational support of important agencies and local EMCOMM groups.

**Q: How does National SOS Radio Network fit in with the Tropical Storm Network?**

**A:** Consider a hurricane scenario. If one is already actively submitting weather data and SITREPs via RRI networks, one will be up and operational for monitoring the National SOS Radio Network channel for emergencies within his neighborhood and surrounding areas. One can even organize and train local community groups to properly verify and report storm damage, weather data, and similar storm impacts via the National SOS Radio Network. This information can then be injected into the RRI network for routing and delivery to the NHC, FEMA and similar agencies.

**Q: What is the plan for RRI emergency exercises?**

**A:** Beginning late summer of 2017, RRI will embark on a cycle of emergency communications exercises. The cycle will start with simple functions and increase in complexity through a full disaster simulation. A complete cycle will cover a period of a year or two, depending on served agency participation, etc. Scenarios will vary as will the area of the country in which a disaster scenario will be simulated. The cycle will be progressive in keeping with professional emergency management practices.

**Q: How do I prepare for the “BIG one?”**

**A:** The “big one” is obviously quite rare. Nonetheless, Amateur Radio is a communications resource of last resort. Therefore, it is logical to prepare for the possibility of a major natural or technological disaster or even a major, coordinated terrorism or cyber-terrorism event. The best way to prepare is to simply exercise the system with general radiogram traffic. This allows operators to develop the basic communications and administrative skills, which are equally applicable to important agency traffic. It is important to remember that the value of traffic work and EMCOMM training is unrelated to the content of routine message traffic. Rather; the skills developed while handling routine traffic are of value. Get involved today!

***IATN CW Watch Frequencies:***

***Daytime Primary: 14115 kHz***

***Nighttime Primary: 7115 kHz***

***traffic concentrated at the top of the hour***

***IATN SSB Watch Frequencies:***

***Daytime Primary: 14235 kHz***

***Nighttime Primary: 7235 kHz***

***traffic concentrated at half-past the hour***

*RRI members and other emergency communications volunteers are encouraged to monitor these frequencies for traffic. During routine operation, these frequencies may be used to transfer message traffic between areas, expedite the flow of delayed message traffic, or inject time-sensitive message traffic into the RRI national messaging layer. These frequencies are also an ideal solution for those requiring an outlet for messages originated from areas lacking cellular service, such as when camping in national parks, state forests or remote areas lacking reliable cellular mobile data service. While traffic may be transferred at any time, it is recommended that CW traffic be cleared at the top of the hour and voice traffic at the bottom of the hour. This will allow volunteers to concentrate their monitoring accordingly. Voice frequencies may be subject to change depending on general frequency occupation and co-channel interference.*

**QNI  
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teur Radio Community.



**Upcoming RRI  
EMCOMM Exercises**

Later this summer, RRI will embark on the implementation of a cycle of emergency communications exercises. While the final details have not been worked-out, it appears our first exercise will be a simple field-deployment event, in which RRI and EMCOMM members will be encouraged to deploy portable stations to the field and transmit a radiogram to target stations indicating their location and geodetic coordinates.

This will be followed by a drill designed to activate the RRI Tropical Storm Network. RRI and EM-

COMM organizations will be encouraged to originate simulated weather data reports and SITREPs from a selected area, the basis being the simulation of a significant Category 5 hurricane event.

In each case, target stations and frequencies will be defined using the RRI National Communications Emergency Response Plan and frequency/mode matrix.

Lessons learned from “Cascadia Rising” indicate that the time has come to further exercise the national messaging layer in order to benefit not just the Amateur Radio Service, but important agencies that rely upon us for situational awareness reports.

**DAYTON HAMVENTION!**

This special issue of “QNI” is dedicated to the Dayton Hamvention. We would like to thank the Dayton Amateur Radio Association for its outstanding support of Radio Relay International. The Inside Exhibits Committee was extremely helpful to us as we planned for the 2017 event at a new venue.

Please stop by booth **6303** to learn more about Radio Relay International and our many programs including:

- The National SOS Radio Network
- The RRI Tropical Storm Network
- The RRI National Communications Emergency Response Plan
- The RRI National Communications Emergency Response Teams
- RRI Training and education for EMCOMM, emergency management, and relief organizations.

RRI is forward-looking. There is room for voice, CW and digital operators in RRI. We believe that many of our fellow radio amateurs are looking for a non-political, communications and technical-oriented approach to public service communications. Furthermore, RRI is not mutually exclusive. We work with all EMCOMM organizations with a singular focus: mission success!