QNI NEWSLETTER

DECEMBER, 2019

OLD SPARKY

"Old Sparky" was toted around the Midwest by your Editor for forty years, visiting radio clubs, engineering societies, and the like as part of a presentation on the early history of radio. A lot of pleasant memories of evenings visiting with fellow radio amateurs were associated with this transmitter, which consists of a Murdock rotary gap, a half-kilowatt AC spark transformer, "mud condensers," a transmit/receive switch and oscillation transformer.

In layman's terms, the spark transmitter works somewhat like a bell. A high voltage spark is discharged across a gap, exciting a parallel L-C circuit, which "rings" at its resonant frequency. Each discharged across the gap associated with the AC wave form "excites" the L-C circuit, which then rings with decreasing amplitude. Think of the spark gap as the equivalent of the striker on an old fashioned bell.

VOLUME 8, ISSUE 3

Winter/Holiday Issue

In this issue:

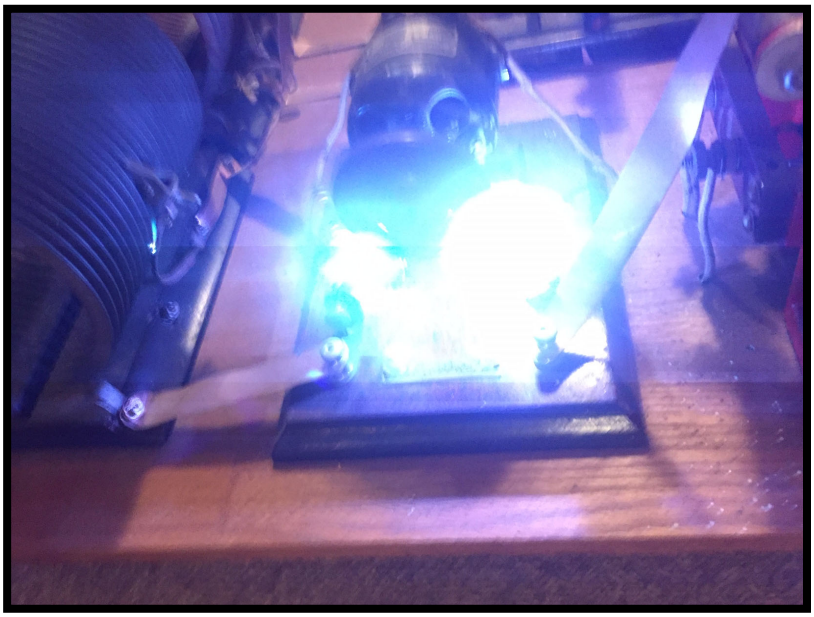
QNI MISSION STATEMENT

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.



The waveform created by a spark transmitter is a damped oscillation. The resonant circuit rings with decreased amplitude until the next discharge across the gap again "rings" the resonant L-C circuit, or, until the amplitude subsides completely.

This early method of generating RF has two serious drawbacks, one of which is significant occupied bandwidth and the other of which is the fact that it can't be modulated.

The solution is, of course, to generate an undamped oscillation, also referred to as "continuous wave." While today we associated "continuous wave" with the on-off keying of International Morse Code, in reality all modern communications methods from AM broadcasting to the latest digital techniques use "continuous wave."

The development of practical vacuum tube oscillators in the late 1910s and early 1920s would not only revolutionize Amateur Radio telegraphy, but give rise to voice technologies and other methods. Radio broadcasting, two-way radio services such as police and aviation radio, facsimile, SSB overseas telephone circuits, radio-teleprinter operations and so forth all emerge in the 1920s thanks to the demise of the spark transmitter.

Despite it's drawbacks, the spark transmitter is certainly dramatic. One can imagine early radio operator transmitting hand-keyed telegraphy, with the noise of the rotary spark gap crackling through the night, the smell of ozone and the thrill of hearing a reply using an early loose coupler crystal receiver or a DeForest Audion in a regenerative receiver. The operation of the high voltage rotary gap must have been a wonder to the uninitiated who might pass by the shack window on a cold winter night!

The time has come to pass Old Sparky on to a new home. It is hoped it will serve a new Amateur Radio community well, telling the story of the early days of wireless when radio amateurs were often at the forefront of the creation of an entirely new industry and public service.

Canst thou send lightnings, that they may go and say unto the, here we are? (Job 38 v 35 KJV)

The Ubiquitous Two Meter Hand-Held Transceiver

By James Wades (WB8SIW)

Two-meter FM remains an extremely important mode in public service communications. VHF-FM handheld and mobile transceivers are ubiquitous. One can step onto an airplane in New York, fly to California, and immediately achieve interoperability with an Amateur Radio EmComm unit at his destination. *Few government agencies have this level of universal interoperability in a two-way radio system.* One might argue that this universality is so valuable that radio amateurs would be unwise to deploy voice modes other than FM on the two-meter band. Attempts to do so run the risk of Balkanizing the universal common denominator we call the "two-meter band" and, in the process, undermining this incredibly unique interoperability and

universality. With other bands readily available, including 220 and 440-MHz, it only makes sense to deploy newer digital voice modes on these less used frequencies.

Two-meter FM hand-held transceivers are ubiquitous and inexpensive. The author still uses an Icom IC-02AT transceiver. Why? For starters, he also has the UHF commercial version, the aviation version, and the marine version. The batteries and chargers are interchangeable. The simple BNC antenna jack is incredibly easy to adapt to mobile or fixed antennas. Spare battery packs that can be stuffed with AA-size dry cells are easy to use. Yes. The radios are big and bit clunky compared to some of today's palm-sized handhelds, but they're all quite bullet proof.

Another, older transceiver that is very useful is the author's FT-290R-II multimode two-meter transceiver. Its advantages include the ability to operate VHF SSB and CW. It also incorporates a battery pack that uses C-cells. The unit will operate seemingly forever at 2.5 watts RF power output using C-cells. The FT-290R-II is older technology, but the transceiver, spare batteries, several antenna options and some extra coax all fit nicely into a waterproof 50-caliber ammo can.

The author's accumulation of older HTs. The aviation version is not shown. The "long-ranger" antenna is shown extended on the right.

One of the author's favorite accessories is the "MFJ "Long Ranger" antenna. This is a telescopic whip designed for two-meter transceivers. By swapping the Long Ranger for a rubber-duck antenna, repeater communications that is marginal or non-existent can be magically transformed into a solid, full-quieting circuit. Yes; the long telescopic whip is a bit cumbersome in a tight space, but the pay-off is worth it. For example, the local club repeater that supports the ARES net cannot be accessed using an HT from the author's neighborhood….until the Long Ranger antenna is placed in service.

Whether one is a traffic operator or simply interested in Skywarn or general ARES®, REACT ® or similar tactical communications activities, the ability to access two-meter FM repeaters remains an extremely important core capability. Look over your VHF-FM equipment today and see what simple steps you might take to improve your ability to support local EmComm functions.

-30-

Take action today to challenge the NYU Petition for Declaratory Ruling. Details at the Radio Relay International Web Page:

www.radio-relay.org

Can a Slave Serve Two Masters

By James Wades (WB8SIW)

Since the terrorist attacks of September 11, 2001, the emergency management process has evolved, or perhaps devolved, into a rather hierarchical framework. Whereas the pre-9-11 process was largely collaborative, the post-9-11 era has seen a move away from this collaborative methodology toward a more paramilitary, top-down approach.

Some of these changes are being driven by the types of individuals being hired to manage the emergency management process. The new emphasis on terrorism preparedness, both domestic and foreign, has led many in local and county government to select individuals with a military or law enforcement background to lead the coordination efforts. Some of these individuals tend to see the world in a rigid, black and white way. They are what Meyers-Briggs would call "SJ" type personalities.

In a military or law enforcement setting, rigid hierarchical arrangements are often necessary. Lower level enlisted personnel or officers can't always discern the "big picture" and *strategic* goals as seen from high levels. A failure to follow orders, or the act of exceeding orders, can have serious and perhaps deadly consequences unforeseen at low levels.

Unfortunately, the overall emergency management process cannot be managed like a military or law enforcement organization. Whereas paramilitary type organizations are structured vertically out of necessity, disaster response is an inherently horizontal network of parallel functions, each with a unique mission and specific management requirements. While these parallel missions are perhaps interlocking and on occasion overlap, attempts to direct them, rather than coordinate them, are fraught with problems because the emergency management director mostly lacks the direct authority and specialization needed to insert himself into the management of the many specialized functions of disaster response.

Those who insist on seeing the World in a hierarchical, vertically integrated way are often poor emergency managers. Unless they have enough intellectual plasticity and flexibility through which they can adopt a collegial and collaborative approach, they will perform poorly in the emergency management environment.

This is not to suggest that a military or law enforcement background is a disqualification. When the author was involved in port security planning, he worked extensively with a USCG officer who grasped the concept of collaboration instantly. She not only had a very flexible mind, but she had a talent for managing people. Her intellectual flexibility resulted in a successful program and was ultimately confirmed by a very successful career.

On the other hand, the overall emphasis on a paramilitary approach has introduced the occasional individual with control issues that prove problematic in an environment that requires collaboration between organizations ranging from law enforcement to social services agencies and NGOs active in disaster response. Attempts to enforce rigid requirements on service delivery or efforts to control the detailed process of direct interface with the community can be extremely problematic when dealing with organizations chartered to provide relief or social services.

Ideally, emergency management is a process of collaboration and *agreement* in advance of a disaster. The emergency plan anticipates and prioritizes hazards and vulnerabilities and the multiple players AGREE to a certain approach to potential incidents and some universal guidelines, which defines their role and basic community standards. The successful emergency manager facilitates the process of each of these organizations as they meet on the level. During the planning process, the players discuss roles and

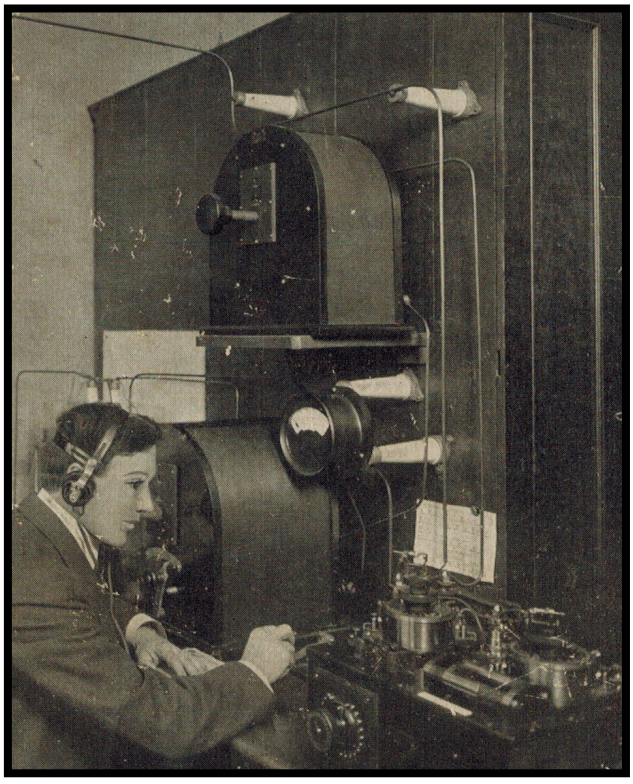
responsibilities, buy-in occurs, and stakeholder agreement flows naturally. During a disaster, the successful emergency manager also perceives himself as a "resource manager" who provides material resources, coordinates mutual aid, and facilitates research and other support activities.

Because of the high risk of "power and control issues" in today's emergency management environment, It is unwise for a community service organization to "enlist" as a subordinate to a government entity. The leadership of a community organization has a *fiduciary responsibility* to limit the organizations liability and respond to those it is chartered to serve in a fair, efficient and equitable manner. Surrendering this fiduciary responsibility entirely to a local or state government entity exposes the organization and its membership to unwanted liabilities. Remember, government works for us…not the other way around.

An emergency communications organization, for example, should retain its independence as a volunteer organization active in disaster response. However, as a player in the emergency response process, they must recognize that certain standards and requirements are obviously necessary. For example, a criminal background check may be necessary for those interfacing with vulnerable populations in shelters. Certain vetting and training is essential when volunteers are staffing an EOC. If supporting government operations in a sensitive facility, such as an EOC or Incident Command Post, the EMA director or other authority has an obvious oversight duty regarding access authorization. In particular, he has full authority to include or exclude any individual or agency of his choice.

It is also essential that topics such as resource allocation and prioritization be discussed periodically and agreed upon or updated as necessary. This arrangement is best reviewed and modified after each disaster operation. Every EmComm group should have its own *Standard Operating Guidelines*, which are developed with served agency input. In a true communications emergency, there may be many organizations and communities to be served. Some flexibility should be retained to allow the EmComm group to respond dynamically to such requirements.

The reality of mutual aid should also be addressed in cooperation with the emergency management agency. In a true disaster, outside assistance will likely be required. The process for accepting and assigning mutual aid volunteers should also be addressed not only with one's EMA director, but with peers in the mutual aid community. Of course, now we're getting into the details and mechanics of disaster response, which are outside the scope of this article. The important point is to understand your organization's role as a partner in the emergency management process while simultaneously avoiding the surrender of your fiduciary responsibilities as a community service organization.



EmComm organizations should retain their independence. This ensures resources will be used wisely. It drives a collaborative approach in which the community organization meets its *government servants* on the level; as peers. By doing so, leadership will not find itself a slave trying to serve two or more masters simultaneously in time of emergency, whether the intended master is the EMA, the Red Cross, or a similar NGO.

-30

The Importance of Peer Review

By James Wades (WB8SIW)

During the past few decades, incompetent management at the ARRL resulted in a lack of leadership in the area of public service communications. While certain "pet areas," such as contesting saw a strong emphasis, the League did little to promulgate standards or articulate a vision for programs such as ARES or NTS. This created a significant leadership vacuum and, as everyone knows, nature abhors a vacuum!

The result has been the proliferation of a numerous self-styled "experts" on all things EmComm related. Amateur Radio has no such thing as a licensing board, professional society or similar organization designed to set standards. Furthermore, in our modern social media environment, anyone with a video camera or a PDF program can distribute training and argue for his point of view.

Some of the information promoted on services such as "YouTube" or on web sites can only be described as incomplete or, in some cases, completely wrong.

There is a reason professional journals require peer review. After all, even honorable, professional researchers make errors or engage in oversights. It's a big World out there and multiple perspectives and a range of experience and knowledge will often point out oversights or false assumptions.

When Radio Relay International was formed, the Board of Directors implemented a peer review process. If one downloads a document on the RRI "Publications" Page, he can rest assured that it was reviewed by a variety of individuals with excellent credentials and a strong background in emergency communications, nor is this a rubber stamp process. It is quite common for a document to go through several edits as these experienced men and women offer careful, constructive criticism.

If you are looking for vetted, peer reviewed information on nets and EmComm, visit the RRI publications page at: http://radio-relay.org/about/publications/

Likewise, if you would like to submit a training document for review and publication on our web site, please do so. Our goal is to provide a reliable resource and we will consider good-quality training documents for publication.

RRI is your go-to source for professional-grade information regarding net operations.

-30-

The War on Winlink
An Editorial

By James Wades (WB8SIW)

Recently, a small group of individuals led by Dr. Theodore S. Rappaport of New York University have engaged in a well-funded, professional assault directed at PACTOR and other modes using ARQ and dynamic compression, on which various public service communications networks are predicated. In reality, it seems likely that this is really a manipulation designed to justify an attack on their real target, which is the Amateur Radio Safety Foundation, operators of the Winlink network.

*It is interesting to note that Winlink has been around for approximately a quarter century***.** Yet, suddenly, NYU has come to the realization that the use of dynamic compression is somehow a threat to Amateur Radio and

national security.

New York University has inferred that the compression scheme used with PACTOR and similar modes amounts to de facto encryption because they cannot be openly copied by the average radio amateur. Essentially, they suggest that the encoding methods used are subject to abuse. **This has since been disproven by a number of qualified individuals**.

Most recently, NYU filed a "Request for "Declaratory Ruling" with the FCC, which, if granted, could prohibit the use of several advanced digital modes. If the FCC were to act on this ruling, Winlink and similar networks, including the RRI Digital Traffic Network (DTN), and numerous local EmComm networks could be degraded or rendered inoperative. The emergency communications capabilities of the Amateur Radio Service would be significantly diminished with significant impacts to the emergency management and NGO communities that rely on ARES, RACES, ACS, AUXCOMM and similar amateur radio resources.

Of course, the reasonable man will quickly conclude that the NYU argument suggesting that all radio amateurs should be capable of easily decoding all communications methods is ludicrous on two levels, one of which is practical and the other of which falls in the context of historical antecedents. In order to illustrate this, let's point to a few examples:

If one has access to historical issues of "QST" Magazine, the author refers the reader to the 1927 series of the magazine in which the Jenkins laboratories advertised facsimile equipment for use on Amateur Radio frequencies. What were the odds that the average radio amateur in 1927 had the capabilities to decode facsimile or even purchase the equipment? The answer was likely near zero, yet the predecessor agency to the FCC and FRC, the Department of Commerce, did not prohibit its use.

How about Radio Teletype (RTTY or RATT)? When the author first set up his station for radio teletype communications well over 40 years ago, he had to leverage connections with the phone company to obtain scarce teletype machines. In one case, a fellow radio amateur drove from Detroit to Saint Louis to pick up two Model 28-ASR Teletypes for our use. Despite the cost and scarcity of equipment, the FCC did NOT prohibit teletype operations at that time even though very few hams could monitor teleprinter communications with its Baudot code and frequency shift keying standard. This is the very reason why the Commission required RTTY operators identify in International Morse. The Commission understood that most hams could NOT decode teleprinter operations, yet they did nothing to prohibit its use from the 1940s to the present day!

Plenty of examples of similar applications of regulatory policy exist in association with historical antecedents. For example, how many radio amateurs had access to SSTV equipment over the years? How many radio amateurs can copy International Morse Code today? How about the old American Morse Code networks in which retired railroad and commercial telegraphers once gathered on 80 and 40 meters to converse in their "mother tongue." Even back in the 1970s, most radio amateurs could not copy American Morse, yet the Commission agreed that its use was not a rule violation because the character set was published. It didn't matter that 99.8 per cent of hams couldn't copy American Morse any more than the fact that that very few hams invested the large sums of money needed to purchase or build specialized Slow Scan TV equipment.

As stated above, today, most hams cannot copy International Morse Code. For the untrained, it is necessary to purchase a specialized device or use software to do so! Do specialized Q-signals, the Phillips Code, ARL Numbered Radiogram texts or other methods of abbreviation amount to "enencryption?" On the other hand,

is it realistic to expect every ham to have available every new technology needed to decode every new digital mode transmitted over the air? Of course not! A regulatory precedent that requires that all (or even most) hams must be able to decode every new, emerging digital method is a recipe for technological obsolescence. It would kill evolution in the Amateur Radio Service.

Another disturbing aspect of the various NYU regulatory filings (they are numerous) is the fact that the university does not limit its discussion to broad policy issues. Rather, in some cases, they specifically target the Winlink system, and by logical extension the Amateur Radio Safety Foundation in formal filings before the Commission. It is quite one thing to deal with PACTOR and radio email in generic terms, but quite another to single out an independent, nonprofit organization. Some have suggested that this type of approach is an abuse of the administrative law process and potentially libelous. It can be argued that such attacks on a legal nonprofit are ethically questionable and a poor precedent to set in the Amateur Radio Service. Unfortunately, NYU Administration did not respond to a request for an interview, so we have no insights into their motivations. Nonetheless, one must admit that this situation paints the picture of a "David and Goliath" scenario, with NYU acting as the "bully."

Questions have also arisen about New York University's lack of standing. NYU is not a licensee in the Amateur Radio Service nor is it a "customer" of the Amateur Radio Service. Some have expressed concerns that NYU may have unprecedented influence on the Commission *not because it is a stakeholder in the Amateur Radio Service*, but rather because of its status as an established, high profile institution in the broader culture. Certainly, it does seem reasonable that the opinions of those who are neither licensees nor direct customers of a radio service should be given less consideration in the regulatory process.

The high-level involvement of an institution such as New York University also leads to several questions to consider:

Is NYU endorsing the personal agenda of one of its employees? If so, have they considered the potential consequences of doing so? Does Dr. Rappaport's opinion as a licensee justify NYU supporting or funding what may be his personal agenda as a licensed radio amateur?

This is a perhaps the most important question to ask. In advance of writing this editorial, the author requested an interview with the President of NYU and his Chief of Staff to determine the answer to this very question. No response has been forthcoming. Unfortunately, this lack of response requires that one consider all possible motivations on the part of NYU. In particular; one must ask another extremely important question:

Why is New York University subsidizing this move to eliminate PACTOR and, indirectly, shut down the Winlink system at potentially significant cost to other networks and users?

Rumors indicate that the University may be providing considerable resources in the form of legal staff and funding for this anti-Winlink effort. The author has been unable to directly confirm this, but at the minimum, NYU is obviously allowing the use of its name and, along with it, the political leverage that such an institution carries. We also know that *Part 97 specifically prohibits radio amateurs from acting out of pecuniary interest*. So, with those two facts in mind, let's try to connect the dots….

Dr. Rappaport is Founding Director of "NYU Wireless," a policy organization operated in support of commercial telecommunications common carriers and other commercial entities in conjunction with NYU. He

is also a founder of two similar organizations at other universities. Here is a portion of the description of the "NYU Wireless" agenda from the University Web Page:

> *Rappaport is the founding director of **NYU WIRELESS,** one of the world's first academic research centers to combine wireless engineering, computer science, and medicine. Before launching NYU WIRELESS in 2012, he founded two large academic wireless research centers: the Wireless Networking and Communications Group (WNCG) at the University of Texas at Austin in 2002, and the Mobile and Portable Radio Research Group (MPRG), now known as Wireless@Virginia Tech, in 1990. He has advised or launched numerous high-tech companies in the wireless communications and computing fields, including Telephia (acquired by Nielsen), Motion Computing, Paratek Microwave (acquired by Research in Motion), Straight Path Communications (acquired by Verizon) and two university spin-out companies that developed some of the technologies now used in the wireless industry–TSR Technologies (acquired by Allen Telecom in 1993) and Wireless Valley Communications (acquired by Motorola in 2005).*

So here we see past connections to Verizon and Motorola. Now, stepping into the present, let's look at some of the corporate entities affiliated with Dr. Rappaport's research (as listed on the University Web Page):

AT&T
Ericsson
Huawei
Nokia
Qualcomm
Samsung
Sony
Sprint
…..and others.

Again, NYU Administration did not respond to our request for an interview, but it seems reasonable that there is some benefit to the University, which is derived from its relationship with commercial entities. Placing this in context, it's generally understood in matters of finance and corporate governance that money is fungible. That is; it's reasonable to assume that funds contributed to the activities of a corporation can be labeled for a specific purpose, but that purpose can obfuscate a desired influence, outcome or hidden agenda because one dollar is just like another. While no one is suggesting that New York University is engaging in some form of skullduggery, one must also admit that this universal reality creates optics that are rather unpleasant.

From the standpoint of perceptions, we see the image of a large, powerful public university, which perhaps derives significant financial support from **commercial** telecommunications interests, using their vast, fungible financial resources to meddle in the affairs of a small, volunteer based nonprofit organization and they are doing so using the broad, blunt power of the Federal Government's administrative law process. Again, while no one is suggesting that there is purposeful wrongdoing, there remain many concerns about an inherent conflict of interest.

The same ethical concerns apply directly to Dr. Rapport. Under part 97.3(A)(4), The Amateur Radio Service is defined as:

"A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest (underline emphasis added by author for clarity)."

Again, no one Is suggesting that Dr. Rappaport is engaged in wrongdoing, but it seems reasonable that his involvement in the Amateur Radio Service should be isolated from his personal employment or business interests. One might argue that he crossed this line when he went beyond presenting his personal opinion as a licensee to the FCC or simply qualifying his credentials, and instead utilized the name and resources of NYU, which maintains a business relationship with commercial telecommunications common carriers; interests that may indirectly pay his salary via those "fungible dollars." Had he simply filed comments or organized the anti-Winlink campaign as an *individual* radio amateur, all of these conflict of interest issues would vanish.

Some have even expressed broad concerns about commercial entities desiring access to Amateur Radio Service spectrum and the existence of a possible hidden agenda designed to discourage continued evolution of the Amateur Radio Service in order to render it obsolete, thereby justifying demands for access to that spectrum at a later date based on diminished public benefit. These theories seem a bit "over-the top," but the optics are again unpleasant. Again, no one is accusing NYU or Dr. Rappaport of wrongdoing, but the silence of University Administration combined with their obvious endorsement of Dr. Rappaport's filings does nothing to dispel rumors or doubt. After all; most employers would not allow their name to be used in association with private matters without Board or executive approval, even in cases where the employee operates at fairly high levels.

Simply put, New York University, despite its lack of standing *as an institution*, has embroiled itself in the affairs of the Amateur Radio Service by providing the power of their name to advance an agenda in a radio service designed to be isolated from commercial interference. Worse yet, in doing so, they have targeted a nonprofit corporation with which the University has no prior business relationship nor any prior business transactions, and in which the *benefactors* of its "NYU Wireless" organization should also have no interest. It seems reasonable that the thinking man could conclude that a very serious conflict of interest exists in NYU's anti-PACTOR agenda, whether intended or not.

We leave it to the reader of this article to speculate about motivations and optics. The University did not respond to a request for an interview, so one can only guess at this point. However, radio amateurs should carefully look beyond the surface issues to consider the possibility that an inherent conflict exists between the university, the wireless industry, its benefactors, and those who wish to retain an independent, nonprofit Amateur Radio Service.

Please note: The RRI Board of Directors has drafted an official reply to the NYU Petition for Declaratory Ruling, which is published elsewhere in this issue. However, **this article reflects only the personal opinion of the author and does not necessarily reflect the viewpoint of Radio Relay International, QNI Staff or any other associated individuals or organizations.**

Preparing Traffic Nets for Emergency Use– Part One

By C. Matthew Curtin (KD8TTE)
Net Manager, Central Ohio Traffic Net

The amateur radio service has long been a part of response to large-scale emergencies. The separation of the traffic system from the emergency service branding used by ARRL and changing nature of emergency management in recent decades have left some supposing that the traffic system has no place in emergency management. Recent developments and results of recent exercises have shown that traffic nets and the broader system they are a part of remain *vital*—but will require adapting to today's needs to be *viable*.

Operations during such exercises as Cascadia Rising showed the traffic system able to handle long-haul traffic, but what about the "first mile" and "last mile" that gets traffic in and out of the system?

ARRL's ARES® program has organized to provide local volunteer operators and technical specialists to public service and public safety agencies in need of communications support. The current edition of the ARES Manual emphasizes the need for *traffic handling* skill among ARES members, including the ability to move traffic to and from the organized system of amateur traffic nets for relaying messages by radio.

Despite this direction, many ARES groups do not encourage their operators to qualify for the handling of third-party traffic except through point-to-point links established at Emergency Operations Centers (EOCs) in counties, regions, and states, as locally organized. Even worse, many traffic nets do not encourage their operators to become qualified to work as part of the organized response to disasters and emergencies through the ARES program and emergency management agencies.

Radio amateurs providing emergency communications during the 1933 Long Beach, California Earthquake. Photo courtesy Long Beach Public Library

The result is that we have ARES members at the scene of an emergency in an Incident Command Post (ICP) and EOCs, but able to make only direct contact with intended stations. Routing traffic, establishing message precedence, and instructions for handling are lost—and accountability for the ICS 213 General Messages exists only insofar as the messages can be identified on the ICS Incident Activity Form or the Form 309 Radio Log.

Traffic nets and the stations on them can provide a valuable service, but need to cooperate—not compete—with brethren serving agencies in the field. Over the course of the past five years, the Central Ohio Traffic Net

(COTN) has engaged in a series of exercises to ensure that served agencies have an outlet for traffic, as do members of the public in need of emergency communication.

Like many traffic nets, COTN simply operated on a regular schedule—once daily—for the handling of whatever traffic was heading out of or coming into the area reachable by the 2m repeater systems in the metropolitan Columbus area. In the past decade or so, toll telephone calls became free, mobile phones and their Short Message Service became ubiquitous, and social media like Facebook and Twitter made it possible for people to remain connected throughout not only emergencies but anniversaries, birthdays, and other special events. “Real” traffic slowed.

Seeing an opportunity to connect the service of a highly resilient messaging system to a community in need, COTN began working with the Emergency Management Agency (EMA) covering Franklin County, whose seat is Columbus, Ohio’s largest city and state capital. Franklin County began building its Community Emergency Response Team (CERT) program, leading many ARES volunteers earned that qualification and completed Emergency Management Institute coursework in a variety of disciplines. Having a longstanding relationship with Franklin County EMA and area hospitals, Central Ohio ARES (now Franklin County ARES), maintained amateur radio systems in the EMA’s Assessment Center.

We began with the assessment of the *need*. COTN operated independently of ARES—with a minority of volunteers participating in both programs. The EMA’s need for maintaining tactical nets with other EMA stations throughout the state was met through ARES, as was the need to ensure that the equipment was in good order. What was not addressed was the need for routing welfare traffic from victims to friends and family who needed to be informed of the status of their loved ones.

COTN encouraged its volunteers to train with ARES as well as to earn the CERT qualification and complete relevant EMI courses. As we developed a core of volunteers with the right qualifications to be accepted for EMA operations, CERT training exercises began to include objectives that made use of the traffic system.

We began with CERT Light Search and Rescue exercises. In the scenario, a regional severe weather event—the kind common in this part of the country—led to damage of an apartment building and a need to recover victims. CERT volunteers established an ICP, search teams, a medical triage area for victims, and other functions needed to support the operation. ARES operators were able to function as radio operators for teams in the field, the ICP, and the EMA’s assessment center.

Boy scouts played the role of victims, and were put in moulage. We assigned each a name, name and contact information for their loved one, and text or other direction for the victim’s traffic.

As victims were removed from the building and awaited medical transport or sheltering, radio operators from a dedicated third-party traffic team offered to route messages for them to friends and family via radio. Net control and relay stations were on-frequency but off-site, most operating from home stations.

In that exercise we learned a lot—some surprising things, considering that the operators were regulars on the traffic net and in handling day-to-day traffic. A few highlights:

1. The traffic net was able to work as a resource for an emergency management agency, able to play a role in communicating on behalf of victims,

2. Not everyone understood what the traffic team did, and even traffic team members didn’t clearly understand origination duties compared to transmission duties,

3. Various garbling happened in the origination process with unfamiliar names,

4. Messages were garbled in relay and delivery in other cases, sometimes changing the meaning,

5. Boy scouts (our “victims”) made sometimes hilarious messages to match their condition, and

Everyone enjoyed the exercise, feeling encouraged to undertake more.

A complete report of our exercise can be found on COTN’s report archive at www.cotn.us/reports/. See “ReportofExerciseandImprovementPlan” there. The complete report shows the text that we assigned to victims, the radiograms that were originated, and complete information on delivered traffic.

Our subsequent in-person training addressed the needs that the operation highlighted. Performance has improved dramatically, as shown in our recent analysis of the 2019 SET, part of the communication exercise BLACK SWAN. But that’s a subject for a future installment in this series.

-30-

Training Column—Net Efficiency?

By Kate Hutton (K6HTN)
RRI Training Manager

Traffic nets are built around efficiency, in order to be able to pass the maximum number of messages in the allotted time.

Ragchewing is relegate to elsewhere or “elsewhen.”
Standard phrases (such as "say again") in net operations are used to avoid confusion.
Net Control literally controls the net, using a standard pattern of exchange, to avoid "doubling."

During an actual exchange of traffic between two net stations, how fast should traffic be sent? The answer sounds dumb. Traffic should be sent at the highest speed that the transmit station can send or voice without mistakes and be understood after the propagation conditions do their evil magic, but no faster than the receive station can both copy and also type or write with legibly pen and paper.

In other words, the appropriate speed depends on the skill level at the two ends, along with signal-to-noise ratio, which in turn depends on conditions (including QRM and QRN).

Going slower than optimum takes more time. Going faster than optimum also takes more time, since "fills" (repeats) become necessary. A traffic net is not a contest! It is an exercise in cooperation.

How do we determine what the optimum speed is? By experience and by listening on the net in question. On CW, a receive station gives a clue by his sending speed, when he sends QRV (I am ready to copy.) If a wrong assumption is made or conditions change, a request for QRS (Send slower) or QRQ (Send faster) can be made, but this option may evoke larger changes in speed than desired.

The transmitting station can send at her own most accurate speed and make adjustments based on fill requests or lack thereof. If conditions are really dismal, Net Control should appoint an appropriate relay between sender and receiver.

Similar considerations also apply to voice nets, both SSB and FM. They even apply to digital modes. Try sending a lot of traffic on a Pactor link under bad conditions and see how long it takes, due to all the

necessary "fills."

Bottom line; be patient with your fellow net ops and with the ionosphere. If you want to show off, make sure you get paired with someone with similar capability, so they enjoy it as much as you do!

Training Column—Did You Know?

By Kate Hutton (K6HTN)
RRI Training Manager

"Time figures" are not necessary for a Routine message, usually. In fact, their presence is almost a sure indicator of 1) a new traffic op (be nice to them; we need them!) or 2) someone using the Winlink template for the first time. If present, time figures should be in the form: 0300Z or 2200L (Zulu or local time, with Zulu preferred). The exception is during a disaster exercise, regardless of the message precedence, when it is good to know how long a message took to get somewhere.

The official traffic date format is, for example, OCT 13. Please use this format in the preamble. In the text, use whatever the signator wants; 10/13 is probably ok for saving a word in the text, but OCT/13 is a little awkward and might require a repeat during a transfer.

Especially in SVC (service) messages, it is OK to use the abbreviations MSG for "message", MSGS for "messages," DLVR for "deliver," DLVD for "delivered," etc. On a voice net, these should be spoken as, for example, "Initials Mike Sierra Golf." There are two advantages to using such abbreviations:

The receiving station has a better chance of keeping up when transcribing the message.

If the message goes to a CW net, it can take significantly less time to send. There is no established abbreviation for DISCONNECTED (telephone number), although one is sorely needed. At least one op that I know uses DISCONN, or maybe we should suggest "DISCO?" [*Editor Note: Perhaps "NWN" the old abbreviation for "nonworking number would be useful?"*]

Regarding the above, remember that if you pass "DLVR" by voice, you must say "Initials, Delta Lima Victor Delta," so the receiving station knows that the word is abbreviated. Similarly, you must distinguish between "OCT" and "October." The radiogram passed should look just like the one the sending station is holding.

For an ARL message, you need not spell the ARL figures phonetically unless conditions are poor. For example, ARL FORTY SEVEN would be "Initials A R L, FORTY I spell F O R T Y, SEVEN I spell S E V E N." A lot of ops don't know this; I was on an Area net when someone pointed it out to me. All other spellings should be in phonetics.

There are certain recipients who require only an abbreviated address: KATE K6HTN PASADENA CA 91104, for example (or maybe only K6HTN PASADENA CA 91104). Still include the town and zip, however. In case the message ends up on DTN, it will save the intermediate operator from having to look that information up. These people are the ones that send a lot of messages and receive a lot of SVC messages. Believe me, ops in their area know how to get messages to them. Phone numbers need not be included.

I taught ops in my Section to formally address SAR/PSHR reports KATE HUTTON K6HTN LAX STM, just so they were aware of how to be formal. I do not expect them to address SVC MSGS or other traffic to me that way.

Within the Section, K6HTN is just fine; from outside the net coverage area, maybe K6HTN PASADENA CA 91104.

Know your nets, and the nets that have reps on your nets! For example, the proper name for the Sixth Region net is RN6, not RN/6. RN6 has two sessions, which are called RN6/1 and RN6/2.

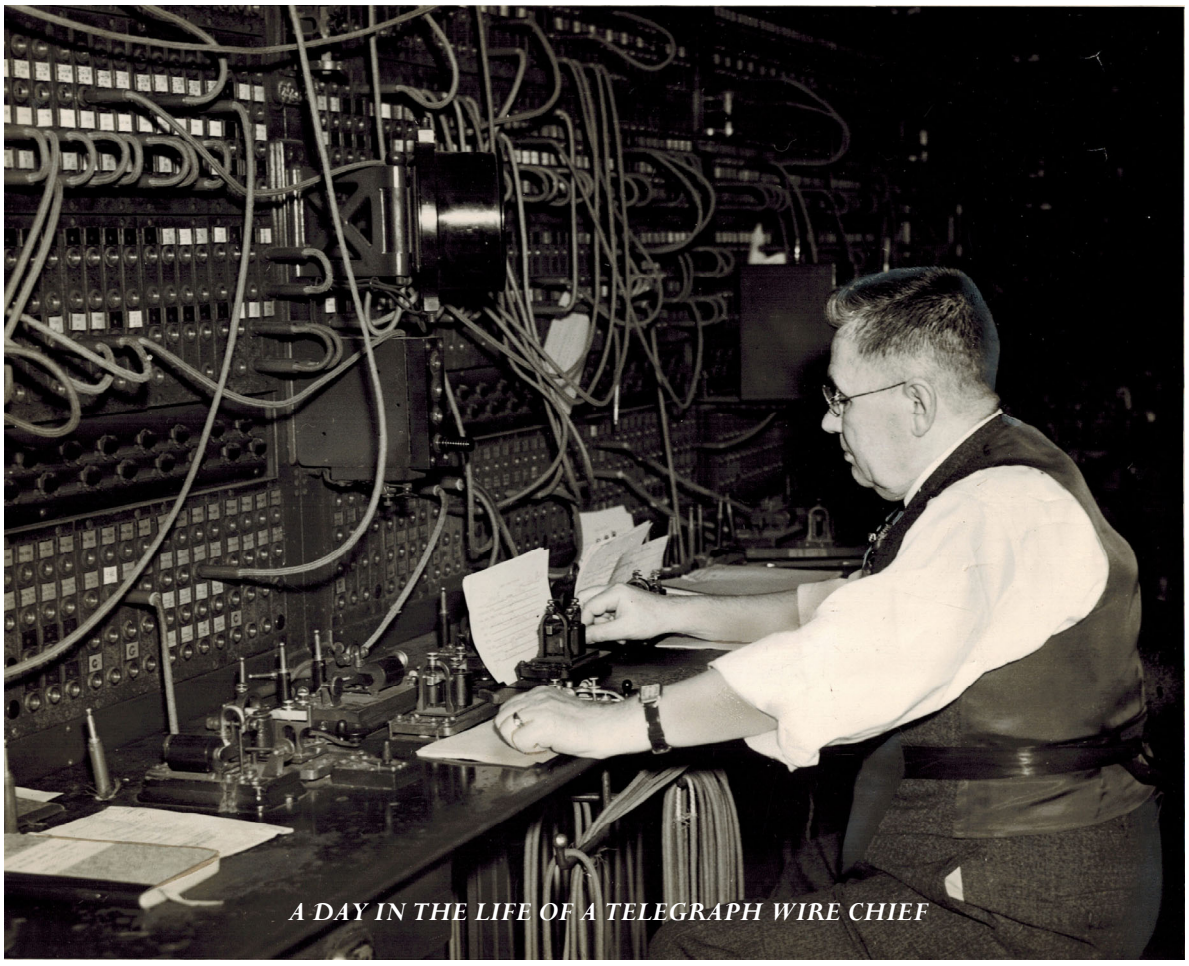
If a net calls for general check ins "with traffic," call first only with your suffix, or at most your callsign, since there are likely to be multiple responses. NCS will then check you in one at a time, by repeating your suffix & waiting for you to give your full callsign and your traffic. This procedure is intended to cut down on "doubling."

Be aware of when NCS or other stations are expecting a response and don't "jump in" then. Doubling wastes net time.

If your net is on a repeater system, there is usually a delay while the system distributes the signal. Hold the button down, take a deep breath & then talk. Otherwise the first part of your transmission is lost.

These are just a few pointers to get you started. For more information, see the RRI Training Manual TR-001 and the RRI Field Manual FM-001 available under the “Publications” heading available at: www.radio-relay.org

-30-



A DAY IN THE LIFE OF A TELEGRAPH WIRE CHIEF

New York University Petition to the FCC for Declaratory Ruling

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Part 97 of the Commission's Amateur Radio Service Rules to Permit Greater Flexibility in Data Communications	)	WT Docket No. 16-239
	)	
Petition for Rulemaking Filed by Amateur Radio Station Licensee Ron Kolarik (K0IDT)	)	RM-11831
	)	
Petition for Rulemaking Filed by the American Radio Relay League, Inc. (ARRL)	)	RM-11828
	)	
Petition for Rulemaking Filed by the American Radio Relay League, Inc. (ARRL)	)	RM-11759
	)	
Petition for Rulemaking Filed by the American Radio Relay League, Inc. (ARRL)	)	RM-11708

PETITION FOR DECLARATORY RULING

On behalf of New York University and pursuant to Section 1.2 of the Federal Communications Commission's ("FCC's" or "Commission's") rules,[1] the undersigned respectfully submit this Petition for Declaratory Ruling, which seeks a ruling that Section 97.113(a)(4) of the Commission's rules prohibits the transmission of effectively encrypted or encoded messages, including messages that cannot be readily decoded over-the-air for true meaning.[2] For years, certain amateur licensees have violated Section 97.113(a)(4) by relying on an interpretation that contravenes the two bedrock principles – openness and transparency – that have enabled amateur radio licensees to self-regulate the Amateur Radio Service bands effectively. This interpretation has restricted Amateur Radio Service licensees' efforts to

[1] 47 C.F.R. § 1.2.

[2] *See* 47 C.F.R. § 97.113(a)(4) ("No amateur station shall transmit . . . messages encoded for the purpose of obscuring their meaning, except as otherwise provided herein.").

effectively self-police the amateur bands, thus enabling the continued violation of *many other* amateur rules. Accordingly, the Commission should eliminate the lingering uncertainty regarding Section 97.113(a)(4)'s meaning and clarify that the rule prohibits the transmission of effectively encrypted or encoded messages, including messages that cannot be readily decoded over-the-air for true meaning.

I. SECTION 97.113(a)(4) PROHIBITS THE TRANSMISSION OF EFFECTIVELY ENCRYPTED OR ENCODED MESSAGES, INCLUDING MESSAGES THAT CANNOT BE READILY DECODED OVER-THE-AIR FOR TRUE MEANING.

Section 97.113(a)(4) explicitly prohibits the transmission of "messages encoded for the purpose of obscuring their meaning, except as otherwise provided [in the rules]."[3] Importantly, the Commission has described Section 97.113(a)(4) as a "prohibition on encryption."[4] Over time, the Commission has implemented and revised Section 97.113(a)(4) so that "the amateur service rules . . . conform to the language of the international *Radio Regulations*."[5] The international *Radio Regulations* "prohibit[] amateur stations from transmitting messages in codes or ciphers intended to obscure the meaning thereof."[6] Therefore, decades-long rule

---

[3] 47 C.F.R. § 97.113(a)(4).

[4] *Don Rolph Petition for Rulemaking to Amend Part 97 of the Commission's Rules Governing the Amateur Radio Service to Provide for Encrypted Communications*, Order, 28 FCC Rcd 13366, ¶ 4 (WTB 2013) (DA 13-1918) ("*2013 Order*").

[5] *Id.* n.3; *see also Amendment of Part 97 of the Commission's Rules to Implement Certain World Radio Conference 2003 Final Acts*, Order, 21 FCC Rcd 278 (WTB 2006) (DA 06-79) (revising Section 97.113(a)(4) "to conform to the current language of Radio Regulations Article 25.2A"); *see also* Letter from Michael J. Marcus, Sc.D, F-IEEE, Director, Marcus Spectrum Solutions, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 16-239, RM-11831, and RM-11828, at 2 (Oct. 13, 2019) (discussing relationship between FCC amateur rules and ITU Radio Regulations) ("Marcus *Ex Parte*").

[6] *Amendment of the Amateur Service Rules to Clarify Use of CLOVER, G-TOR, and PacTOR Digital Codes*, Order, 10 FCC Rcd 11044, n.6 (WTB 1995) (DA 95-2106) ("*PacTOR 1 Order*").

interpretations have stressed the need for open, transparent communications in the amateur bands.

For years, certain amateur licensees have skirted these requirements,[7] sending and receiving communications over amateur bands using communications modes that incorporate dynamic compression techniques[8] and, by extension, effectively encrypt or encode the communications.[9] These amateur licensees combine dynamic compression with Automatic

---

[7] *See* Letter from Ari Q. Fitzgerald, Counsel to New York University, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 16-239, RM-11831, RM-11828, RM-11759, and RM-11708, Attachment at 4-6 (Oct. 8, 2019) (discussing "long standing problems" in the Amateur Radio Service); Reply Comments of Theodore S. Rappaport, N9NB, PS Docket No. 17-344, WT Docket No. 16-239, RM-11708, and RM-11306, at 9-10 (highlighting the longstanding efforts of certain amateur licensees to effectively encrypt communications and advocacy to permit effectively encrypted communications).

[8] "Compression" is a technique that reduces the number of bits needed to send a particular message, which conserves bandwidth and improves spectrum efficiency. *See* Theodore S. Rappaport, WIRELESS COMMUNICATIONS: PRINCIPLES AND PRACTICE, Ch. 7 (1st ed. 1996). Almost all of today's Amateur Radio Service data modes use static compression with publicly known static compression tables, which allows all Amateur Radio Service licensees to listen to messages over-the-air for true meaning under reasonable propagation conditions. Where static compression is used, a known, fixed, and well-documented mapping of bits is defined for any symbol of the alphabet. By contrast, dynamic compression formulates a new, unique compression table each time a message is sent. Each formulated compression table is unique to each individual message. Aspects of the dynamic compression "key" are sent as part of the unique message itself and are not known universally. If any bits are lost by an Amateur Radio Service licensee attempting to listen to the message over-the-air, it is virtually impossible for the licensee to understand the message. Therefore, dynamic compression provides a "moving target" that makes it extremely difficult – if not virtually impossible – for an Amateur Radio Service licensee attempting to listen to the message to decompress the message for true meaning.

[9] Winlink is an example of a system that has contravened the Commission's requirements. Winlink is a "worldwide radio email service" that relies on amateur radio bands. *See* Winlink Global Radio Email, *News*, https://www.winlink.org/ (Sept. 11, 2019). Winlink utilizes certain communications modes that compress email communications to send them more efficiently over amateur radio bands (*e.g.*, PacTOR, PACTOR 2, PACTOR 3, PACTOR 4, WINMOR, ARDOP, and VARA). Aside from PacTOR, which was open-source and approved for use by the Commission in 1995, the communications modes have not been publicly documented in a way that allows amateur operators or the public to understand messages sent by the Winlink system over amateur frequencies and are therefore not subject to the Commission's exception that would permit their use. *See* 47 C.F.R. § 97.309(a)(4) (permitting use of "any technique whose technical

Repeat Request ("ARQ"), which allows only two linked stations to complete a transmission without error. For other amateur licensees who attempt to "hear" a message sent using dynamic compression and ARQ, fading and interference will prevent those licensees from receiving an error-free copy of the message, thus effectively obscuring the dynamic compression key and the messages themselves for anyone other than the two locked stations. Other licensees will thus be unable to reconstruct the decoding and compression scheme and, by extension, unable to decode the message for true meaning.[10]

---

characteristics have been documented publicly" and listing PacTOR as an example, but not PACTOR 2, PACTOR 3, PACTOR 4, WINMOR, ARDOP, or VARA); *see also PacTOR 1 Order* (approving use of open-source PacTOR).

While software has apparently been developed very recently to decode Winlink communications when sent using different PACTOR modes, the software's efficacy and availability is unclear when applied to existing PACTOR-capable modems. If any bits or letters are missed or corrupted during the reception – as would be expected under HF propagation – the message cannot be realistically decoded. *See* Letter from Hans-Peter Helfert, DL6MAA, to Scot Stone, Federal Communications Commission, WT Docket No. 16-239, RM-11831, at 3 (Oct. 22, 2019) ("Decoding will be performed properly until there is a gap in the input data stream. Missing data in the received data stream thus . . . leads to an abort of decoding.") ("Helfert *Ex Parte*"). Furthermore, no decoding has been developed for other Winlink communications modes (*i.e.*, VARA, ARDOP, and WINMOR).

[10] At least two commenters have claimed that Winlink messages may be monitored over-the-air, albeit under unrealistic, controlled conditions that do not represent reasonable propagation conditions. *See* Helfert *Ex Parte* at 3 ("Decoding will be performed properly *until there is a gap in the input data stream.*") (emphasis added); Comments of Gordon L. Gibby (KX4Z), RM-11831, at 1 (Apr. 9, 2019) (allegedly demonstrating over-the-air monitoring under highly controlled conditions) ("Gibby Comments"). If the alleged monitoring solutions work as claimed, these commenters should have no objection to the Commission issuing the requested declaratory ruling.

While one might argue that it is also virtually impossible to monitor point-to-point amateur transmissions in microwave bands if high gain/narrow beam antennas are used in a point-to-point transmission, this can be differentiated from effective encryption because: (1) such point-to-point radio paths are very efficient, have a small impact on other spectrum users, and generally do not cover distances more than a few kilometers; (2) such point-to-point radio paths would occur at UHF frequencies and above, where there is significantly more Amateur Radio Service spectrum than at HF frequencies; and (3) the narrow beamwidths resulting from such antennas may produce some privacy away from the direct line-of-sight path but still allow third parties to monitor for true meaning via radio propagation caused by antenna sidelobes, scattering, moving

The amateur licensees that rely on dynamic compression techniques have justified the use of these compression techniques by stating that, although they make it virtually impossible to readily decode the communications for true meaning, the compressed messages are not "encoded *for the purpose of obscuring their meaning*."[11] Under this conveniently narrow interpretation of Section 97.113(a)(4),[12] dynamic compression techniques (and resulting encryption that minimizes openness and transparency and prevents effective self-policing of the amateur bands) are justified and defended as simply a byproduct of an intent to use limited spectrum resources more efficiently.[13]

Despite claims that the relied-upon communications modes are not *intended* to obscure the meaning of messages, users of these communications modes have publicly acknowledged precisely the opposite. For example, users have stated that the communications modes – and the dynamic compression techniques on which they rely – are used in order "to reduce spectrum use *and to enhance privacy*."[14] This public admission demonstrates an intent to "obscure" the messages' meaning from others who are self-policing the amateur bands, in violation of Section 97.113(a)(4). By linking compression to efficient spectrum use *and* privacy, the admission also

---

a receiver into the main beam, or other propagation mechanisms, while also allowing significant decreases in required transmitter power with less interference to other spectrum users in the area.

[11] 47 C.F.R. § 97.113(a)(4) (emphasis added).

[12] *See* Marcus *Ex Parte* at 1 (describing Part 97 rules as "anachronistic provisions that made sense when they were adopted decades ago *but are ambiguous or problematical today*") (emphasis added).

[13] *See, e.g.*, Helfert *Ex Parte* at 2 (The compression techniques "ha[ve] nothing to do with encryption or obfuscation, but only serve[] to reduce the amount of data."); Gibby Comments at 2 (stating that certain amateur licensees rely on "compression techniques to speed transfer and result precious bandwidth-time utilized"); Comments of SCS, RM-11831, at 2 (Apr. 15, 2019) (discussing how "onboard" and "outboard" compression efficiently utilize shortwave spectrum).

[14] *See, e.g.*, ARRL Maryland-District of Columbia Section, *Winlink 2000 Radio-E-mail System Overview*, http://www.arrl-mdc.net/Winlink/MDCWL2KOVwAM.htm (Sept. 15, 2019) (emphasis added).

highlights how amateur licensees may easily evade Section 97.113(a)(4)'s prohibition on messages "encoded for the purpose of obscuring their meaning." Without clarification from the Commission that Section 97.113(a)(4) prohibits the transmission of messages that cannot be decoded over-the-air for true meaning under reasonable propagation conditions, amateur licensees will continue to evade the Amateur Radio Service's self-enforcement mechanisms by simply stating *another* purpose for using technologies that render messages extremely difficult to decode, even with additional software and hardware converters.

Furthermore, while spectral efficiency has been cited as the reason for relying on many of these communications modes, the actual efficiencies gained do not outweigh the costs associated with eliminating effective self-policing of the amateur bands. The compression techniques are used largely for non-time sensitive applications (*e.g.*, email), and the time saved can be measured in mere fractions of a second, or a few seconds at most. At the same time, the cost of implementing a static and public compression solution that would allow amateur licensees to intercept and decode messages for true meaning is minimal. Amateur Radio Service licensees already rely on many other published communications modes that use public, static compression,[15] which allows all users and the public to intercept messages over-the-air and decode them for true meaning under reasonable propagation conditions. An entity relying on communications modes that effectively encrypt messages could easily switch out the code that implements dynamic compression techniques for code that implements static compression, and this switch can easily be made through a software update. Therefore, entities using communications modes that effectively encrypt messages could push a simple software update to their users; provide and widely demonstrate a public, static compression method that may be

[15] Examples include JT-65, WSPR, PSK-31, CW, FT-8, and FT-4.

used by the broad Amateur Radio Service community to decode messages for meaning over-the-air under reasonable propagation conditions; and comply with Section 97.113(a)(4)'s openness requirement.

II. THE RECORD DEMONSTRATES THAT VIOLATIONS OF SECTION 97.113(a)(4) ENABLE VIOLATIONS OF OTHER RULES GOVERNING THE AMATEUR RADIO SERVICE.

As the above example demonstrates, a narrow interpretation of Section 97.113(a)(4) renders Section 97.113(a)(4)'s prohibition on "messages encoded for the purpose of obscuring their meaning" toothless. A narrow interpretation undermines amateurs' efforts to self-police the amateur bands, consistent with long-standing Commission policy,[16] and enables the violation of other amateur rules, including:

- **47 C.F.R. § 97.113(a)(3)**, which prohibits "[c]ommunications in which the station licensee or control operator has a pecuniary interest, including communications on behalf of an employer." For example, Winlink's current enforcement mechanism reveals that e-mails traveling through Winlink's system violate Section 97.113(a)(3).[17] Unfortunately, Winlink's current enforcement mechanism requires users to log in online and review messages after the messages have traveled over-the-air, therefore rendering traditional, contemporaneous Amateur Radio Service enforcement efforts (*e.g.*, interception over-the-air and decoding for true meaning) ineffective.

- **47 C.F.R. § 97.113(a)(5)**, which prohibits "[c]ommunications, [made] on a regular basis, which could reasonably be furnished alternatively through other radio services." For example, Winlink transmits regular e-mail communications, including commercial e-mail communications,[18] over the amateur frequencies. There are many other FCC-regulated radio services available for regularly sending these data communications.[19] The rules

---

[16] *See 2013 Order* ¶ 6 ("[T]he amateur community has a long tradition of self-regulation.").

[17] *See, e.g.*, Reply Comments of Janis Carson, Ron Kolarik, Lee McVey, and Dan White, WT Docket No. 16-239, RM-11708, RM-11759, and RM-11831, at 29-60 (July 19, 2019) (providing extensive evidence in FCC Enforcement Bureau Ticket No. 3184322 that recent e-mails traveling through the Winlink system violate amateur service rules).

[18] *See id.* at 29-60 (providing evidence of commercial e-mail communications traveling through the Winlink system).

[19] *See, e.g.*, SailMail, https://sailmail.com/ (Oct. 14, 2019) ("SailMail supports email communications using every internet communications device in all oceans of the world."); Iridium, Iridium GO!, https://www.iridium.com/products/iridium-go/ (July 15, 2019) (offering

governing the other radio services do not require the same level of openness and transparency as the rules governing the use of amateur frequencies. The Commission is clear that the Amateur Radio Service is not like other radio services. In dealing with petitions seeking to broadcast music or bulletins over the amateur bands, the Commission has reinforced the need for the Amateur Radio Service to serve strictly as a hobby, without providing access to or services via the amateur radio spectrum by or for the public.[20] The Commission has also expressed its "strong commitment to maintaining the unclouded distinction between the amateur service and other radio services."[21] Faced with incontrovertible evidence that Winlink is rendering indistinct the barrier between the Amateur Radio Service and other radio services, the Commission should now reaffirm its commitment to this principle.

- **47 C.F.R. § 97.115(a)(2)**, which restricts third party communications to stations in only certain, specified jurisdictions. The Commission lists countries with which U.S. amateur stations may transmit messages for a third party.[22] Winlink's current enforcement mechanism reveals that e-mails have traveled through the Winlink system that violate the third party restrictions.[23]

- **47 C.F.R. § 97.115(b)(1)**, which requires that, with regard to third party communications, the "control operator [be] present at the control point and is continuously monitoring and supervising the third party's participation." For example, many of Winlink's control operators are not "continuously monitoring and supervising" to determine whether third party participation complies with the amateur service rules. Instead, these control operators are relying on automatically controlled digital stations ("ACDS"), which send e-mail messages over the amateur bands that may violate the Commission's rules.

---

satellite-based text, call, e-mail, and web browsing); Globalstar, Sat-Fi2 Satellite Wi-Fi Hotspot, https://www.globalstar.com/en-us/products/voice-and-data/sat-fi2 (July 15, 2019) (offering "e-mail, text, talk, . . . [and] access to the web"); and OCENS, Inc., OCENSMail, https://www.ocens.com/e-mail.aspx (July 15, 2019) ("Complete e-mail solution for satellite and other low bandwidth connections").

[20] *Amendment of Part 97 of the Commission's Rules Governing the Amateur Radio Services, et al.*, Notice of Proposed Rulemaking and Order, 19 FCC Rcd 7293, ¶ 39 (2004) (FCC 04-79) ("The Commission adopted this prohibition to ensure that amateur service frequencies were not used as a substitute for other communication services.").

[21] *2013 Order* ¶ 6.

[22] *See* Federal Communications Commission, Wireless Bureau, Mobility Division, Amateur Radio Service, *International Arrangements*, https://www.fcc.gov/wireless/bureau-divisions/mobility-division/amateur-radio-service/international-arrangements (Oct. 14, 2019).

[23] *See* Letter from Ari Q. Fitzgerald, Counsel to New York University, Theodore S. Rappaport, N9NB, Director, NYU WIRELESS, and Michael J. Marcus, N3JMM, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 16-239, RM-11831, RM-11828, RM-11759, RM-11708, at 6 (July 24, 2019).

- **47 C.F.R. § 97.105(a)**, which requires that control operators ensure "the immediate proper operation of the station, regardless of the type of control." Failure to comply with Section 97.115(b)(1) also leads to violations of this more general provision.

- **47 C.F.R. § 97.101(b)**, which prohibits the exclusive use of a frequency. The use of an ACDS to operate part of the Winlink system can cause the commandeering of certain amateur frequencies, effectively shutting out other amateur users and making exclusive use of the frequency.

A narrow interpretation of Section 97.113(a)(4) that requires specific intent to obscure a message's meaning and thus allows for the effective encryption of messages – so long as the sender can cite *another* purpose for relying on communications modes that effectively encrypt the message – enables the clear violation of numerous other rules governing the Amateur Radio Service. When it drafted Section 97.113(a)(4), the Commission could not reasonably have intended for its Amateur Radio Service rules and the Amateur Radio Service's primary enforcement mechanism (*i.e.*, the self-policing by other Amateur Radio Service users) to be rendered toothless. The Commission can correct course by clarifying that Section 97.113(a)(4) prohibits the transmission of encrypted or encoded messages, including messages that are effectively encrypted or encoded and cannot be decoded over-the-air under reasonable propagation conditions for true meaning.

III. CONCLUSION

The Commission previously has recognized the Amateur Radio Service's "long tradition of self-regulation."[24] For years, certain parties have undermined this tradition by relying on an ahistorical interpretation of Section 97.113(a)(4) that contravenes the two bedrock principles – openness and transparency – that have enabled amateur radio licensees to effectively self-regulate. Failure to clarify that the rule prohibits the transmission of effectively encrypted or encoded messages that cannot be readily decoded over-the-air for true meaning has restricted

[24] *2013 Order* ¶ 6.

amateur licensees' self-enforcement efforts, thus enabling the continued violation of other rules. Accordingly, the Commission should eliminate the lingering uncertainty regarding Section 97.113(a)(4)'s meaning and clarify that the rule prohibits the transmission of effectively encrypted or encoded messages that cannot be readily decoded over-the-air for true meaning.

Respectfully submitted,

/s/ Ari Q. Fitzgerald

Ari Q. Fitzgerald
John W. Castle
HOGAN LOVELLS US LLP
Washington, DC 20004
Tel: (202) 637-5423
Fax: (202) 637-5910
ari.fitzgerald@hoganlovells.com

Counsel to New York University

Theodore S. Rappaport, N9NB
Founding Director, NYU WIRELESS
David Lee/Ernst Weber Professor of
Electrical Engineering
New York University
2 MetroTech Center, 9th Floor
Brooklyn, NY 11201
Tel: (646) 997-3403
tsr@nyu.edu

Michael J. Marcus, N3JMM
Sc.D. Fellow IEEE
Marcus Spectrum Solutions, LLC
8026 Cypress Grove Lane
Cabin John, MD 20819
Tel: (301) 229-7714
mjmarcus@marcus-spectrum.com

October 24, 2019

Radio Relay International Response to NYU Petition for Declaratory Ruling

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 97 of the Commission's Amateur Radio Service Rules to Permit Greater Flexibility in Data Communications	)	WT Docket No. 16-239
	)	
Petition for Rulemaking Filed by Amateur Radio Station Licensee Ron Kolarik (K0IDT)	)	RM-11831
	)	
Petition for Rulemaking Filed by the American Radio Relay League, Inc. (ARRL)	)	RM-11828
	)	
Petition for Rulemaking Filed by the American Radio Relay League, Inc. (ARRL)	)	RM-11759
	)	
Petition for Rulemaking Filed by the American Radio Relay League, Inc. (ARRL)	)	RM-11708

RESPONSE TO NEW YORK UNIVERSITY PETITION FOR DECLARATORY RULING

Radio Relay International hereby recommends dismissal of New York University's Petition for Declaratory Ruling in reference to the above matter based on its lack of merit. In order to support this claim, we intend to deconstruct the New York University (hereafter "NYU") petition by pointing out several fallacious and inappropriate claims. We will also attempt to place current Amateur Radio Service digital methods in their appropriate context from the standpoint of historical antecedents, the regulatory purpose of the Amateur Radio Service, and by defining the role of digital modes in advancing the public interest.

In their opening remarks, NYU implies that certain digital methods are "effectively encrypted or encoded." This claim is inherently false. The digital modes in question, while compressed, are

not encrypted. While many modern data modes are compressed as a method to improve efficiency on communications circuits in which signal-to-noise ratios are less than optimum, all digital modes currently in use on Amateur Radio Service frequencies can be readily decoded using off-the-shelf consumer devices such as a laptop computer and sound card. This has been proven in actual practice. For example, in one case, a Radio Relay International registered radio operator wrote his own software over a period of just a few days to decode advanced PACTOR communications. He is neither a professional engineering nor professional software expert, but is, instead, a medical doctor and active radio amateur.

NYU also implies that illegal activity is occurring on Amateur Radio Service frequencies as facilitated by networks utilizing digital methods. For example, the petitioner states that "certain amateur licensees have violated Section 97.113 (a)(3) by relying on an interpretation that contravenes two bedrock principles – openness and transparency." Accusations of illegal activity should not be made lightly, yet NYU provides little, if any evidence of a pattern of violations in their submissions. Even if a few abuses have occurred, these would likely be classified statistical outliers and not representative of digital network users, the vast majority of whom have been proven to be reliable and respectful of the rules.

NYU also accuses unnamed licensees of "skirting…requirements." Again; this statement is designed to imply that violations are occurring. Who are these "certain amateur licensees?" Is there any record of these "certain amateur licensees" having been subject to disciplinary action within the administrative law process? What complaints are on file with the Commission from neutral third parties? What investigations, if any, have been performed by monitoring stations or FCC field office personnel?

NYU's choice of language should also be troubling to the Commission. The petitioner seeks to infuse its language with a variety of implications that appear questionable. For example, NYU attempts to argue that advancements in digital communications methods might lead to "violation of *many other* amateur rules [emphasis is that of NYU]." Such blatant manipulations are troubling and point to significant concerns about the transparency and forthrightness of the petitioner's filing. Simply put; *NYU owes the Commission data and facts so that a ruling that serves the public interest can be made. Rationalizations and inferences are insufficient.*

NYU attempts to equate "encryption" and "dynamic compression." Yet, few would argue with the statement that *encryption is designed to obfuscate communications in such a manner that content cannot be understood (decrypted) by unauthorized parties.* On the other hand, compression methods as typically applied in the high frequency spectrum exist solely for the purpose of improving throughput on data circuits of less than optimum signal-to-noise ratios. The mixing of terminology by NYU amounts to little more than the classical fallacy of false equivalence.

NYU associates terms such as "encoding" and "encryption" in a manner that implies interchangeability. Yet again; encoding does NOT equate with obfuscation nor does it equate with nefarious purposes. Examples of encoding have been commonplace during the entire existence of the Amateur Radio Service, from its first legal inception with the passage of the Radio Act of 1912 through the present. For example:

1. The radiotelegraph code (International Morse) has been widely used on Amateur Radio Service frequencies for over a century. Furthermore, overlays of specialized abbreviations, Q-codes, QN-signals, Z-codes, ARL codes and Phillips Code methods

have also been regularly applied as an overlay by operators seeking to improve the efficiency of Morse circuits for nearly a century. Today, the majority of radio amateurs cannot copy the radiotelegraph code and therefore have no practical way to monitor this specialized method of communications.

2. Radioteletype communications ("RTTY" or "RATT") using the five-level baudot code has been commonplace in the Amateur Radio Service since the late 1940s. This specialized method of encoding, combined with frequency shift keying methods at 45, 50 or 75 baud cannot be decoded using a typical communications receiver or transceiver without additional equipment, yet, it has been ruled legal in the Amateur Radio Service for over 70-years because the designed intent of the encoding process is NOT to obfuscate communications but rather to facilitate communications.

3. Slow-scan television (SSTV) has been used on high frequency amateur circuits for many years. This mode requires specialized equipment and techniques that are rarely available to the average radio amateur, yet the mode has been authorized by the Commission for well over 50 years.

In its many filings, NYU has argued that advanced digital modes are problematic because specialized modems are typically used to encode and decode digital transmissions. However, the requirement for specialized equipment is certainly not new. As alluded to above, for many years, expensive, bulky mechanical teleprinters were required to transmit and receive radioteletype communications. Likewise, slow-scan television mode required extremely expensive, specialized equipment to monitor on-air communications. The reasonable person will quickly note that

PACTOR-equipped modems and computer sound card interfaces are ubiquitous and inexpensive compared to the teleprinter or SSTV equipment of the past.

Self-policing and monitoring:

NYU also claims that dynamic compression techniques limit self-policing of the Amateur Radio Service. They also state that "the actual efficiencies gained [by dynamic compression] do not outweigh the costs associated with eliminating effective self-policing of the amateur bands." Yet, they fail to make their case. No statistically significant data demonstrating hinderance to self-policing is provided. No references to Commission investigations are provided. No administrative law rulings are referenced. NYU even fails to provide even anecdotal evidence.

In fact, many of the operators that utilize the digital methods in question are perhaps some of the most responsible, well-regulated operators in the Amateur Radio Service. They are not only quite capable of self-policing; they have a proven track record of responsible conduct. Most users of modern digital modes such as PACTOR, WINMOR, VARA and NBEMS are volunteers affiliated with local, state and Federal emergency management programs. A sizeable percentage, if not a significant majority of these operators, have received training from local, state and Federal emergency management and public safety agencies and many of these volunteers are subject to background investigation. NYU's fallacious arguments serve only to sully the reputation of these dedicated volunteers.

The Petition is Regressive

In reality; the NYU petition can only be described as regressive. The Amateur Radio Service is predicated on experimentation and advancing the radio art and therefore requires considerable

flexibility and a liberal interpretation of the rules in question. The strict interpretation demanded by NYU could eliminate both current and future digital communications innovations based on unsupported claims of rule violations that are neither statistically significant nor predicated on case law, documented Commission actions or public interest complaints.

In our opinion, the Commission stands at a crossroads. The Commission can condemn the Amateur Radio Service to future obsolescence based on the poorly constructed arguments of New York University, or the Commission can interpret the issue within the basis and purpose of the Amateur Radio Service. We believe the Commission has the expertise and wisdom to identify the reality that abuses of the referenced digital modes and networks are de minims based on the data and facts at hand.

The Petition is Not in the Public Interest

The Amateur Radio Service Rules specifically define one of its several purposes as being that of emergency communications in time of need. Numerous emergency management agencies and relief agencies rely extensively on the Amateur Radio Service for supplemental disaster telecommunications services during hurricanes, earthquakes and terrorist attacks. Digital networks supporting emergency management agencies and relief organizations at the local, state and Federal level rely extensively on digital methods utilizing dynamic compression. Attempts to limit or disable these networks will have a deleterious impact on these emergency communications programs, which is contrary to the public interest.

Furthermore, claims by NYU that relative throughput speeds are irrelevant are likewise inherently false. Those with expertise in disaster telecommunications theory and practice will

readily assert that circuit capacity is a critical factor in the maintenance of timely command, control and communications functions in time of emergency. While it may be true that circuit capacity is not a critical issue during routine operations, dynamic compression is a significant benefit when higher levels of circuit capacity are required in time of emergency. Few reasonable emergency management or defense experts would argue with the assertion that maintaining access to more efficient baud rates or throughput on digital networks is a significant advantage under disaster conditions.

Lack of Standing

While perhaps a sensitive topic, we feel it is nonetheless important for the Commission to consider New York University's standing in this issue. NYU is not a licensee in the Amateur Radio Service. While the general public has a broad interest in all regulated communications services, one must consider the highly activist nature of NYU within the context of WT Docket 16-239, RM-11831, RM-11828, RM-11759 and RM-11708.

NYU seems unusually concerned with the status of digital networks within the Amateur Radio Service, but the petitioner fails to explain the basis of its interest. NYU also fails to make a statistical or even anecdotal case showing how the continued use of advanced digital modes have harmed or diminished the university as an institution.

The Commission undoubtedly must consider standing in these issues and must therefore seek to understand the foundational purpose for New York University's interest in these issues. A failure to identify this purpose is an excellent indicator that NYU and NYU Wireless may lack standing in this matter.

Conflict of Interest

It is also recommended that the Commission view this petition and other filings from NYU from the standpoint of conflict of interest. NYU and "New York University Wireless" are closely connected with the commercial telecommunications industry both in terms of financial support and on-going advocacy. Yet, the Amateur Radio Service is charted as a non-commercial, voluntary radio service in which pecuniary interest plays no role.

While no evidence of a hidden agenda is present, nor are any accusations of a hidden agenda being made, one must nonetheless express some level of discomfort at the obvious position of NYU as a "conduit" of influence between commercial telecommunications common carrier interests and a voluntary, non-profit radio service designed by regulators to be isolated from commercial interference.

Based on the history of New York University and its principle's involvement in the creation of two other, similar advocacy organizations at other universities, it seems quite reasonable that New York University cannot totally isolate its fiduciary responsibilities to its commercial telecommunications partners from the nonprofit nature of the Amateur Radio Service, even if their intentions are honorable.

Summary

In summary, New York University simply fails to make its case. It applies logical fallacies and makes unsubstantiated claims in an effort to limit or arrest technological evolution in the Amateur Radio Service; **a radio service specifically designed to encourage innovation and the evolution of technology through experimentation**. Furthermore, the granting of their petition would be harmful to the public interest, due to its potentially deleterious impacts on the

ability of the Amateur Radio Service to provide reliable disaster telecommunications services to the public and served agencies. Lastly, an inherent conflict of interest, even if unintentional, exists between the commercial interests of New York University and the non-profit, voluntary nature of the Amateur Radio Service as intended by regulation.

Based on its significant lack of merit, we respectfully request that the Commission deny the petition for declaratory ruling.

Respectfully submitted,

RADIO RELAY INTERNATIONAL

James Wades, Secretary
by authority of the Board of Directors

PO Box 192
Buchanan, MI. 49107
269-650-0215
james.wades@radio-relay.org

QNI NEWSLETTER

C/O Emergency Preparedness Associates, LLC
PO Box 192
Buchanan, MI. 49107

Editor: James Wades (WB8SIW)
Email: jameswades@gmail.com
Tel: 269-548-8219

Assistant Editor: Kate Hutton (K6HTN)

An Independent Newsletter

QNI is published quarterly…or more often when the Editor feels like it!

Ring Out, Wild Bells

Ring out, wild bells, to the wild sky,
The flying cloud, the frosty light:
The year is dying in the night;
Ring out, wild bells, and let him die…

Ring out false pride in place and blood,
The civic slander and the spite;
Ring in the love of truth and right,
Ring in the common love of good.

Ring out old shapes of foul disease;
Ring out the narrowing lust of gold;
Ring out the thousand wars of old,
Ring in the thousand years of peace.

Ring in the valiant man and free,
The larger heart, the kindlier hand;
Ring out the darkness of the land,
Ring in the Christ that is to be.

- Alfred Lord Tennyson

Merry Christmas and Happy New Year to all readers of the "QNI Newsletter." May the new year bring you health, happiness and success!

AN OLD MEMORY

A somewhat younger version of your Editor visiting with Will Etelemaki. (W8EOI– SK). Will was a long time traffic operator and member of the Michigan Net, QNI. Will was a competitive ski-jumper in his youth and was assigned to an alpine unit during World War Two. His unit was perhaps best known for rescuing Bob Dole. Will was awarded the Silver Star for valor during the war. I recall fondly the kindness and hospitality of Will and his wife. He won't be forgotten.