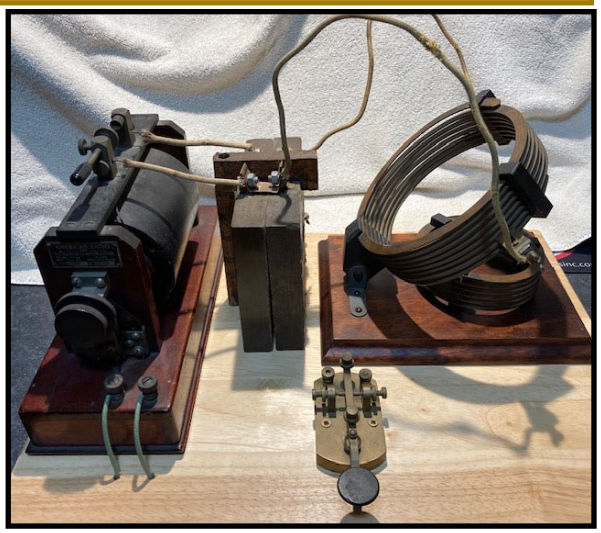
QNI NEWSLETTER

SEPTEMBER, 2020

RURAL ELECTRIFICATION?



It's easy to forget that there was a time during which the majority of rural America had no mains electrical service. While government subsidies under the New Deal Rural Electrification Administration accelerated the expansion of the electrical grid, some rural areas in the United States still did not have mains power until the mid-1950s.

While the early rotary spark gap transmitter, with its high voltage transformer and electric motor driven rotary gap, operating from 25, 50 or 60 Hertz AC power, is an impressive (and loud) device to witness in operation, there remained many radio amateurs in the early 1920s who lived in deep suburban or rural areas without mains power.

VOLUME 9, ISSUE 2

Autumn Issue

In this issue:

QNI MISSION STATEMENT

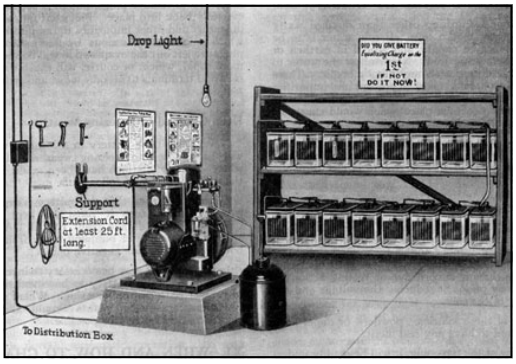
QNI is dedicated to promoting genuine emergency communications preparedness.

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.

It was in this environment that the AMRAD company began manufacturing DC spark transformers for Amateur Radio service. Two versions were available, one of which was configured to operate from a 6-Volt storage battery and another configured to operate from 32-Volt lighting systems; a standard associated with Delco and Fairbanks-Morse light plans, which powered lights and appliances on remote farms.

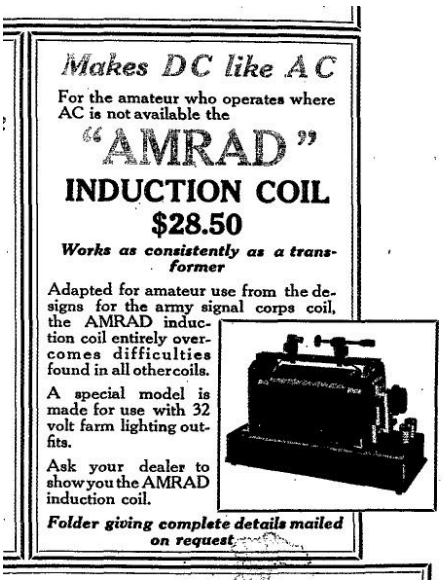


Delco Light Plants, a development by Charles Kettering, brought electric light and efficient appliances to North American rural farms and homes.

The AMRAD spark coil was originally designed for use by the Army during World War One. This "100-watt" spark coil, particularly when combined with a quenched spark gap provided fairly good performance for a spark transmitter. At 6-Volts, the spark transmitter draws approximately 6-amps. Needless to say, the charge on a lead-acid automobile battery of the day probably didn't last long. Nonetheless, this model of spark coil found brief popularity amongst rural radio amateurs and also wealthy yachting enthusiasts, who used it for maritime communications on 500 kHz (600-meters) during the early 1920s.

AMRAD was well established with Wall Street investment capital but always seemed to find itself a step or two behind the technology curve. While this spark coil was a well designed and nicely manufactured product, it was being marketed in direct competition with another technology that was perfected during the First World War; the vacuum tube CW transmitter. Continuous Wave was already on its ascendance and, within a couple of years, this model of AMRAD spark coil was being sold surplus at a fraction of its original price.

AMRAD was also an original licensee under the Hazeltine Neutrodyne patent, which, during the mid-1920s, was a veritable gold mine in radio manufacturing. Unfortunately, even here, AMRAD delayed entering the market and found itself a year to two behind other manufacturers of note, such as Stromberg Carlson, Freed Eisemann, FADA and others. Needless to say, AMRAD never achieved the returns promised their investors.



Today, this old spark transmitter sits high on top of a book case in the radio room. It's a pleasant reminder of the exciting, early days of wireless communications when every radio amateur was a pioneer.

A Pilot's Knee Board

By James Wades (WB8SIW)

Checking into the HBN CW Net while operating portable in the field.

Recently, while reorganizing my office, I came across an extra pilot's knee board. For those unfamiliar with such a device, it's essentially a scaled-down clipboard that one straps to one's leg.

The kneeboard was developed to make efficient use of the cramped space in an aircraft cockpit. It's ideal for taking notes or keeping airport data and aeronautical charts readily available. Today, several versions exist, including those that include binder clips for incorporating multiple pages of data and paperwork for longer flights. For pilots who like to rely more on technology, one can get a kneeboard in which paper charts and notepads are replaced with a convenient holder for an iPad.

It seems the pilot's kneeboard is an excellent tool for portable and mobile radio operation as well. In my case, I modified my spare kneeboard by mounting a small "Palm Mini Paddle" to it for use with my portable HF CW transceiver. A 4 x 6 inch "Rite in Rain" notebook fits nicely on the clip board along with the key, allowing one to take notes and transcribe messages under a variety of conditions.

While my kneeboard is modified for CW use, the kneeboards designed for use with a tablet might be ideal for portable digital operation in the field or in a mobile unit. It sure beats balancing a tablet on your leg!

Back in "the day," I purchased my kneeboards at specialty shops catering to pilots. However, a quick look at online retailers reveals a wide variety of products readily available for use by anyone. Prices are reasonable, and such a device seems very useful for mobile, portable and field operation by both traffic operators and EmComm volunteers.

Net Control in Poor Conditions

By C. Matthew Curtin (KD8TTE)

The oft-repeated tagline "when all else fails" is often justification for amateur radio in public service. How well do our nets perform when conditions are poor? Are we really able to function as advertised or do we spend our time explaining to a served agency or member of the public for whom all else has failed, why HF won't get the job done today?

Someone who needs to communicate doesn't need a physics lesson. We either do the job and are useful, or

we can't do the job and we're not useful. As Master Yoda instructed us all: "Do or do not; there is no try."

But how do we get the job done when propagation isn't enough for radiation to overcome absorption? Time for a meditation on operation!

First, we need to consider the design of the typical amateur radio net. For better or worse, the net is typically *directed*, which means that all contact happens with or at the direction of the *net control station*. The net is typically *open*, which means that any station may join the net when called for, rather than *closed* where net control will have a predefined set of stations. The result can be that nets can be very large and even full of stations with no function.

This design is not ideal for most nets' stated objectives, but it works when conditions are good, and an effective net control operator needs to work with the situation at hand. A lecture on ideal net design to putative net members, when they've got business to do, is unhelpful. In poor conditions they won't hear most of it anyway. "Do or do not; there is no try."

In a directed net, the net control station has one job, and one job only: to control the net. That job cannot be accomplished if the net control station does not have communication with the intended members of the net.

The net script is a guide for net control; whether the script includes it or not, you can ask for relays. Rather than having stations wondering if the net is running, calling in without hearing net control, and triggering others to do the same, net control can assert control of the net by enlisting the help of other stations, and maintaining control of the control frequency.

For example, let's consider a net where the stations in the net are:

KD8TTE, Net Control

W6RRI

W1AW

Especially in difficult conditions, it's quite likely that each station in the net can hear and be heard by a different set of stations on frequency. Rather than passively hoping for stations to call blindly and then to be relayed in by another station, net control can actively look for more stations, directing others on the net.

KD8TTE: W6RRI, please call for stations for the net, out.

W6RRI: This is W6RRI for net control, stations for the net, over.

Stations assisting net control are able to do so efficiently by repeating everything back such that net control can hear it. Let's presume that W6RRI did get a response. The exchange would look like:

KD8TTE: W6RRI, KD8TTE. please call for stations for the net, out.

W6RRI: This is whiskey six romeo romeo india for net control, stations for the net, over.

K8RSO: This is kilo eight romeo sierra oscar, with traffic over.

W6RRI: Kilo eight romeo sierra oscar, please list your traffic over.

K8RSO: One routine Columbus, over.

W6RRI: Roger kilo eight romeo sierra oscar, one routine columbus, out.

Because net control can hear W6RRI, that station's read-back of K8RSO's critical information meant that net control has all of the information from the relayed station. Net control also should record not only which stations are in the net, but how they joined the net, whether by direct contact with net control or through a relay, and if so, which station.

The net can continue to operate even in very poor conditions. Net control can further direct calls for relays, for example:

KD8TTE: W6RRI. please ask K8RSO to call for stations for the net.

W6RRI: W6RRI, Wilco.

W6RRI: K8RSO this is W6RRI, over.

K8RSO: K8RSO, over

W6RRI: K8RSO, please call for stations for the net.

K8RSO: This is kilo eight romeo sierra oscar, stations for the net, over.

W8THV: This is, whiskey eight tango hotel victor, no traffic.

K8RSO: Roger whiskey eight tango hotel victor, no traffic, out.

K8RSO: W6RRI, K8RSO.

W6RRI: W6RRI.

K8RSO: W6RRI, this is K8RSO. I have whiskey eight tango hotel victor, no traffic, over.

W6RRI: K8RSO, W6RRI, Roger whiskey eight tango hotel victor, no traffic,out.

KD8TTE: W6RRI, roger, thank you, out.

Through all of this, it's important for net control to act decisively and to keep the net moving. Speaking assertively, actively, ensuring that stations on the net know what they're to do is important for efficient operation.

In more difficult conditions, net control might wish to invoke more rigid procedures and even get to a point where almost everything said is in the form of prowords. Being terse isn't rude, it just aids in understanding.

When it's difficult to hear, is a receiving station more likely to understand:

> W6RRI, call for stations, out,
>
> > Or,
> >
> > W6RRI, I say old boy, could you find it in your heart to engage your transmitter for the purpose of arousing the attention of any station wishing to join our fair net intending for any required communication to traverse our circuits should it be deemed lawful under the rules established by the Federal Communications Commission and in compliance with good amateur procedure?

With the way 75 meters has been lately, that transmission could thrice go from 20dB over S9 to 20dB under the noise and back again!

In poor conditions, net control needs to make use of other stations, which further helps to keep the other stations active, and is also a good way to train newer operators who might just be learning how to operate nets. It's a team effort. Recognizing the roles that we play on the nets, doing our best to fulfill them, and relying on one another to play their part will go a long way in operating even in bad conditions. Patience, kindness, and perseverance can take the operation the rest of the way to success.

-30-

WXOBS Messages

By James Wades (WB8SIW)
RRI Emergency Management Director

A strong case can be made that traffic nets are an underutilized resource. This is often evident during major weather events, such as hurricanes, major winter storms or ice storms. During any of these events, traffic nets would be an ideal source for additional weather data.

The first instinct of many radio amateurs is to run to one of the 20-meter wide-coverage nets. These nets provide a useful service, but they also suffer from some deficiencies. These include:

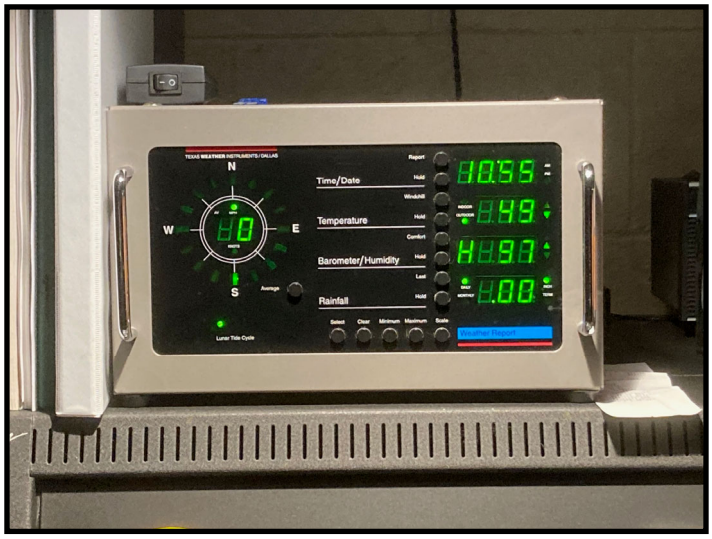
- Obtaining access to the net can be problematic. The large number of stations participating can consumes considerable circuit capacity. Sometimes a "contest-type" pile up ensues.
- As demand on circuit capacity increases and propagation becomes marginal, it is the loudest signal that attains priority, rather than the station holding the most important traffic.

On the other hand, traffic nets employ a classical concept of net layering. While the operational net structure must sometimes be adjusted, or special circuits employed to ensure efficient message propagation times by managing traffic load, this classical concept can prove far superior to a pile-up on 20-meter SSB. Standardized procedures and traffic prioritization methods ensure that the most important messages are handled first.

One area in which traffic nets can really excel is in the collection of weather data. This was proven in Michigan several decades ago when the traffic nets operated a rain gauge network for the National Weather Service. The National Weather Service provided traffic operators with good quality rain gauges, and selected operators at key points equipped with the extremely accurate standard US Government 8-inch gauge. Whenever measurable precipitation occurred, traffic system volunteers would report daily readings to a "NWS Liaison," who would collect the data and send it to the National Weather Service. During major storms, the reporting frequency was increased accordingly.

***Above**: The author's weather sensors. The standard 8-inch government gauge provides superior accuracy, particularly when measuring the liquid equivalent of snow. It is also used to periodically check calibration of the professional-grade remote-reading tipping-bucket rain gauge. The multiplate radiation shield in the foreground isolates the temperature/humidity sensor from insolation.*

***Below**: The indoor console, which displays weather data indoors and transmits it via serial buss to the computer. A float battery is behind the unit to power it in the event of an AC mains outage.*



Net managers worked with NWS hydrologists to develop a software tool that stripped the data automatically from each radiogram, compiled it automatically into a tabular format and then distributed the data via the NOAA Weather Wire Service. The data from the traffic system volunteers was considered some of the best precipitation data in the state and was used to check calibration of the WSR -88D Doppler Weather RADAR VIL algorithms. Ten QMN CW Net members received NWS "Special Service Awards," but, sadly, certain amateur radio associations refused to publish the award photo because it was "too controversial" at the time when the CW testing requirement was a hot topic of debate.

In more recent years, programs such as CoCoRaHS and various networks of automated digital weather stations have emerged, many of which are used daily by consumers and meteorologists. While such systems are convenient, they are heavily reliant on the Internet and cellular data networks. In the event of widespread commercial telecommunications common carrier disruptions, such as those seen in Puerto Rico during Hurricane Maria, many of these weather stations could go offline.

Consumer-grade weather stations also suffer from some problematic accuracy issues, such as:

- While temperature and humidity sensors are rarely problematic from a technical standpoint, the siting and installation methods used may not be sufficient to provide truly accurate data.

- The small diameter throat of some consumer-grade rain gauges can create accuracy issues under windy conditions. Likewise, the tipping bucket mechanisms within some gauges tend to under-report torrential rainfall amounts during severe thunderstorms and tropical events.
- Sensors and rain gauges must be cleaned and the calibration must be checked periodically.
- Wind sensors are often installed in less than optimum locations due to the nature of residential areas.

The combination of survivability issues and accuracy concerns combine to make a case for obtaining additional data, particularly during major weather events, whether that event is a significant Nor'easter snow storm or a Category 4 or 5 hurricane.

An excellent style manual rain gauge. A reasonable diameter throat improves accuracy. The expanded scale of the internal funnel is readable to 0.01 inch. More than one inch of rain overflows into the outer container. During the winter, the funnel and internal cylinder are removed so that snow can be collected and melted to determine liquid equivalent. (Photo courtesy of Ambient Weather.)

Weather instruments need not be of the latest digital or wireless type. Excellent manual weather instruments can be obtained. Military ML-102E through G series aneroid barometers are readily available on auction sites at reasonable prices. Older microbarographs, once the standard instrument for meteorologists are available as well. These latter devices record barometric trends on chart paper and provide outstanding accuracy. They are an excellent forecasting tool when combined with other weather data. The minimum one needs to report weather data via the traffic system during a major event might be:

- A good quality, temperature compensated aneroid barometer, barograph or microbarograph.
- A good quality thermometer properly shielded from incoming solar radiation (insolation).
- A well designed rain gauge with resolution to 1/100th of an inch.

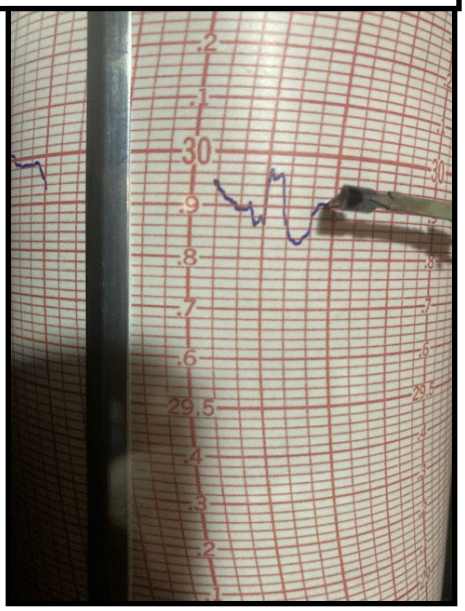
While wind sensors are an excellent addition, siting wind sensors is problematic in many residential areas. World Meteorological Standards specify a 10-meter height (about 32-feet), located in an open area at least ten times the distance away from the height of the nearest object. Obviously, most home weather stations cannot meet this criteria beyond installing the sensors in as open a location as possible and at a height somewhere above nearby trees or outbuildings.

Traffic Networks and Weather Observations

Traffic networks are an ideal resource for systematically and efficiently collecting weather data. These networks are survivable and decentralized, and radio amateurs are already dispersed throughout a potential disaster area. Many radio amateurs have personal weather stations already installed. Additional weather data can be collected from nearby weather enthusiasts via programs such as "Neighborhood Hamwatch." Cooperating EmComm organizations such as REACT or ARES can provide additional data sources. In other words, even if a traffic operator does not have a weather station, he can obtain data from a nearby volunteer observer, fire station, school, university or similar facility.

Above: *The author's older barometers. On left a Belfort Microbarograph. On right an Army ML-102E aneroid barometer.*

Below: *The barometric pressure recorded during a widespread derecho event. The thick vertical line calibrated in inches mercury represents noon. Each vertical line thereafter represents two hours. One can see the gust front with sustained severe winds arrive at approximately 6-PM. Damaging winds ranging from 70 to 100 mph were reported throughout the Upper Midwest.*



The Radio Relay International "WXOBS" message format is defined in Appendix A, Example 7 of the National Emergency Communications Response Plan. Traffic operators are encouraged to become familiar with this message format and its nuances.

With sufficient volunteer interest, local or state traffic nets could build a daily reporting program around the WXOBS message format, in which traffic operators make a weather observation once per day and, if precipitation occurs, originate a WXOBS message to an assigned liaison station with the responsibility of delivering the data to the National Weather Service. In doing so, operators would be fully familiar with the process, and the reporting frequency could be increased during major weather events. For example, during a major winter storm reporting frequency could be increased to every six hours, or during a major hurricane the reporting frequency might increased to every hour or two hours.

***Upcoming Emergency Communications Exercise*:**

The Radio Relay International *Fourth Quarter Emergency Communications Exercise* will be built around weather data reporting. Part one of the exercise takes place in two phases on September 15 and September 19, simulating a Gulf Coast hurricane and New England Hurricane respectively. Part Two of the exercise will take place at a date yet to be determined in November, simulating a major winter storm impacting the Upper Midwest.

A copy of the Exercise Plan is published in this issue of the *QNI Newsletter.* Traffic operators are encouraged to review the exercise plan and familiarize themselves with the WXOBS message format.

Once familiar with the format, volunteers should ensure that their personal weather instruments are properly calibrated and serviced in time for the exercise. If you do not have a personal weather station, arrange for weather data from a nearby ARES member, REACT member, or other volunteer observer. If one is obtaining weather data remotely, it is preferable to obtain it via a survivable means, such as Amateur Radio, GMRS, FRS, CB, or another survivable communications circuit.

Motivated traffic operators can expand the weather data collection process by implementing a Neighborhood Hamwatch program. This same network can be used to collect not just weather data, but useful situational awareness data, which can be of great value to local, state and even Federal emergency management during dangerous weather events.

A direct link to the RRI National Emergency Communications Response Plan may be found here:

http://radio-relay.org/wp-content/uploads/2020/08/RRI-NECRP-2020-8-1-Final-Approved.pdf

A direct link to the Fourth Quarter Emergency Exercise in September may be found here:

http://radio-relay.org/wp-content/uploads/2020/08/RRI-Fourth-Quarter-2020-9-Exercise-One-FA.pdf

Last of the Pony Express Riders Tells His Story

By William Campbell

From "Dots and Dashes," 1932

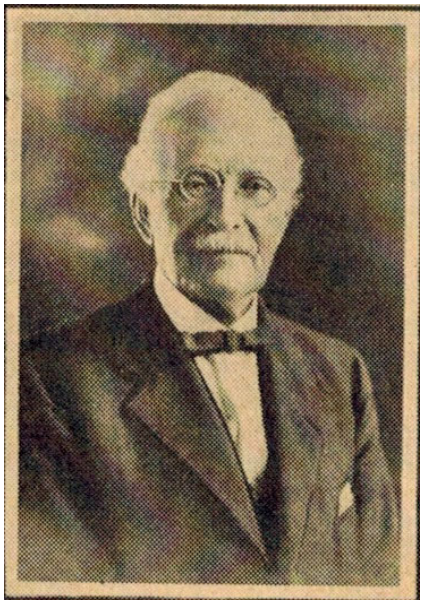
When Western Union completed the first transcontinental telegraph line through the wilds of the mid-West and West on October 24, 1861, it put an end to the famous Pony Express, which for sixteen months had covered the 1400 miles between St. Joseph, Missouri and Sacramento, California.

After echoes of their pounding horses' hoofs died away, the fearless riders, who "got through in spite of hostile Indians, wolves, buffaloes, snowstorms and other dangers, turned to other frontier occupations. "Buffalo Bill" Cody, "Wild Bill" Hickok," "Pony Bob" Haslam, Jim Moore and all the rest of the transcontinental pony express riders have passed away now save one. The lone survivor is William Campbell of Stockton, California – the only living man who can tell from personal experience of the glamorous Pony Express days, and this is his story:

"I was a bullwhacker, hauling provisions and military supplies by wagon train to forts in the West in the spring of 1860, when Russell, Majors and Waddell decided to establish the Pony Express. Then I was sent north to the Oregon Trail to freight supplies to the Pony Express stations.

It was December 1860 before I had my chance to ride. I was six feet tall, weighted 140 pounds and was too large, but many riders could not stand the grind, and more were needed. My relay was between Valley station, eleven miles east of Fort Kearney, and Box Elder Station, three miles west of Fort McPherson. This

was 95 to 100 miles along the Platte River, and my first ride was in a heavy snowstorm.



William Campbell in 1932

I made a hard ride over my relay carrying President Lincoln's first message to Congress. The Pony Express was put to the test carrying this message; we got it through in seven days and eighteen hours. We made another fast run with the news that Fort Sumter had been fired on.

One night, I came to a pack of large buffalo wolves finishing the carcass of some animal. They refused to move when I rode at them and my horse shied at the smell of blood and animals. I blew my horn, but it had no effect. There was nothing to do but try to flank and outrun them. I gave my scared horse his head and the wolves finally fell back when the lights of the next station showed in the distance. The next day, I poisoned a carcass and twelve dead wolves were around it when I came back. I got squaws from the nearby Sioux tepees to make the pelts into fine robes.

My first contact with the telegraph company was at Fort Kearney, at the western end of the telegraph line, where I stopped to pick up telegrams that traveled the rest of the way to the west by Pony Express. I always remember the kindness of Mr. Ellsworth, operator of the Western Union office at Fort Kearney. He was always ready to do a favor for the riders and usually had coffee on hand. It was just prior to the Civil War and Mr. Ellsworth furnished us with news of the impending struggle. I would sit and eat cookies, and hear the news until the last minute, then go and maintain my schedule.

Once I spent twenty four hours in the saddle carrying the mail 120 miles to Fairfield with snow two or three feet deep and the mercury around zero. I could tell where the trail was only by watching the tall weeds on either side and often had to get off and lead my horse. There was no rider to go on at Fort Kearney, so I went on to Fairfield twenty miles away.

Once my horse, Ragged Jim, stepped in a buffalo wallow in the dark, and I went over his head dragging the mail with me. I could not find the horse so set off with the mail on foot to the next station. Buffaloes were in the thousands on the trail. If a rider ran into a herd of them he was lost.

The telegraph line was built from Fort Kearney, to Fort Laramie, to Salt Lake City and met the line being built east from Sacramento through Virginia City, Ruby Valley and Deep Creek. When it was completed, the Pony express had served its purpose and went out of existence. And now at Stockton as the last of the Pony Express riders, I watch the modern world and marvel. Greatest of all inventions to me, because it affected me directly, is the telegraph. In the two minutes we used to be allowed to change horses at a station, Western Union now sends a message to New York or even London. The telegraph today does in a second what it took eighty young men and hundreds of horses eight days to do when I was a rider for the Pony Express.

Learning Morse on an Instructograph

By James Wades

Learning CW today is fairly easy. The combination of efficient software and computers allows one to practice CW almost anywhere. Of course, it wasn't always so convenient. There was a time when the options for individual instruction were limited primarily to phonograph records or devices such as the Instructograph.

The Instructograph is a fairly simple device. It consists of a phonograph motor, a spring contact, and, depending on the model, an oscillator or a simple battery supply to operate a telegraph learners set. As the phonograph motor pulls a perforated tape through the spring contact, perforations representing dots and dashes close the spring contact and key the oscillator or sounder.

A typical Instructograph came with ten double-sided, perforated tapes, each of which incorporated increasingly difficult material. For example, tape one might be the alphabet followed by simple letter combinations, whereas other tapes incorporated words and cipher groups, while the 9 and 10 tapes consisted of telegrams or marine radiograms. Tapes were available for both Continental Code (International Morse) and American Morse Code. The Instructograph offered big advantages over the LP records with their limited content, which the student quickly memorized.

Pictured below are two Instuctograph units, the first of which is the unit on which I learned Morse. The other, older unit belong to Cecil "Doc" Langdoc, a New York Central System Telegrapher, who was perhaps best known as the operator who transmitted the play-by-play broadcasts for Notre Dame Football Games.

ARRL WELCOMES PAUL Z. GILBERT, KE5ZW, AS DIRECTOR OF EMERGENCY MANAGEMENT

From the "ARRL Letter"

As another step in ARRL's increased focus on strengthening its emergency communications capabilities and long-standing working relationships with federal and state agencies and private emergency response organizations, ARRL has hired Paul Z. Gilbert, KE5ZW, of Cedar Park, Texas, as its first Director of Emergency Management.

Gilbert brings more than 30 years of experience in public service in both his professional and amateur radio endeavors. Beginning with his appointment as Emergency Coordinator in 1987, he has held multiple positions in the ARRL Field Organization. Currently in his second term as South Texas Section Manager, he has also served for more than a decade as the West Gulf Division's Assistant Director for Public Service, acting as liaison between Division leadership and local, state, and federal emergency management organizations.

Professionally, Gilbert most recently was Radio Officer, HQ Staff, for the Texas State Guard, where for the past 6 years he has been responsible for planning and implementation of the organization's communications capabilities. Previously, he was a Public Safety Radio Coordinator for a Texas agency, charged with overseeing that organization's large-scale disaster communications response and identifying and eliminating in-state interoperability issues.

Gilbert, who has an Amateur Extra-class license, is a member of Army MARS, and holds numerous DHS certifications, including COML, COMT, COMT Instructor, and AUXCOM Communicator. He is a member of the FEMA Regional Emergency Communications Coordination Working Group (RECCWG), a graduate of the FEMA Emergency Management Institute's Exercise Design Course, and was a founding member of the Texas Division of Emergency Management Communications Coordination Group.

In his new role, Gilbert will manage a team responsible for supporting ARRL Emergency Communications (EmComm) programs and services, including the Amateur Radio Emergency Service® (ARES®) and National Traffic System (NTS), as well as lead the continued modernization of those programs in consonance with the future emergency communications needs of the public and ARRL's key partners.

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The Radio Relay International Board of Directors would like to congratulate Mr. Gilbert on his new position.

Traffic operators and local/section nets in Regions 1 through 5 are encouraged to participate in the upcoming Radio Relay International Fourth Quarter Emergency Exercise. Details on page 14 and at:

http://radio-relay.org/wp-content/uploads/2020/08/RRI-Fourth-Quarter-2020-9-Exercise-One-FA.pdf

Radio Relay International
4th Quarter Emergency Exercise
September 16 and 20, 2020 (UTC)

Background:

Modern digital weather stations with convenient Internet connectivity have resulted in the widespread automation of weather observations, particularly at the cooperative observer and consumer levels. Entire data collection programs are built upon interconnected networks of weather stations. However, during widespread, extended power outages or catastrophic events that disrupt the Internet or cellular data networks, connectivity with many of these weather stations can be lost.

Consumer-grade weather stations may also be subject to some inaccuracies, particularly during heavy rainfall and high-wind events during which remote-reading rain gauges (e.g. "tipping bucket rain gauges") can exhibit significant errors. Therefore, observations made with a good quality, manual, direct-reading rain gauge can add important accuracy to an automated network.

By supplementing automated systems with a network of manual reporting methods, it is possible to not only expand the amount of data available, but also ensure that some gaps can be filled when automated networks are disrupted. The combination of manual reporting methods and RF-only methods, such as APRS and traffic networks, remain important in time of emergency.

Additional Assets:

Traffic operators represent additional, valuable assets in the event of a major weather event. By leveraging these assets to collect additional data, the accuracy of hydrological models and forecasts can be improved. Traffic networks can also be used to convey brief situational awareness reports in parallel with weather observations to provide additional "ground truth" data, thereby providing additional insights into a disaster situation. These benefits apply whether the event is a major hurricane, a severe winter storm event, or a widespread ice storm.

Integrated Staging Functions:

By activating traffic nets to collect weather data during an event, connections are established, and resources are staged in advance for use during the response phase of the disaster. This facilitates a seamless transition into operational status during which welfare traffic or operational message traffic transmitted on behalf of local emergency communications units or served

agencies may be transmitted. In other words, as the requirement for weather data decreases as the storm passes, circuit capacity becomes available for welfare, priority, or emergency message traffic.

Exercise Goals:

1. Familiarize participants with the WXOBS radiogram message format defined in the RRI National Emergency Communications Response Plan, Appendix A, Example 7.

2. Test the ability of networks to transfer WXOBS messages from point of origination to region target stations in a timely manner.

3. Test the ability of the target station operators to accurately populate a weather data spreadsheet for delivery to served agencies.

4. Measure message propagation times through the network from time of observation to the time of appearance in served agency data stream.

5. Measure message accuracy (message integrity) at point of delivery.

6. Qualitative analysis of the accuracy of amateur weather instruments.

Exercise Dates and Participating RRI Regions:

RRI Regions 4 and 5:	September 16 (160001Z to 160400Z)
RRI Regions 1, 2, and 3:	September 20 (200001Z to 200400Z)

Network Topology:

Primary traffic flow:

Each participating RRI region will be assigned a CW and DTN target station with the responsibility of collecting WXOBS radiogram messages for their respective regions. These target stations will transcribe this weather data into tabular format (spreadsheet) for periodic delivery to the served agency.

WXOBS messages may be originated via any *participating* state (section) or local net within one's RRI Region provided a Cycle-4 CW or DTS liaison station is available. If a local or section net is not participating, participants may inject their WXOBS message directly at the region net level or via the Digital Traffic Network through a cooperating Digital Traffic Station (DTS).

Alternate traffic flow:

Alternate target stations using the SSB and CW modes will also be present on 40-meters to accommodate stations holding WXOBS messages. These target stations may be used if a region target station or DTS is unavailable.

Manual Mode Target Stations:

The table below shows the frequencies for the manual mode target stations as well as the weather observation schedule for participating stations After obtaining the necessary hourly weather observation, the radio operator will format his WXOBS message and originate it as soon as practical.

Consolidated Frequency Table and Observation Schedule

RRI Emergency Exercise September 2020

Manual Mode Frequencies by Region

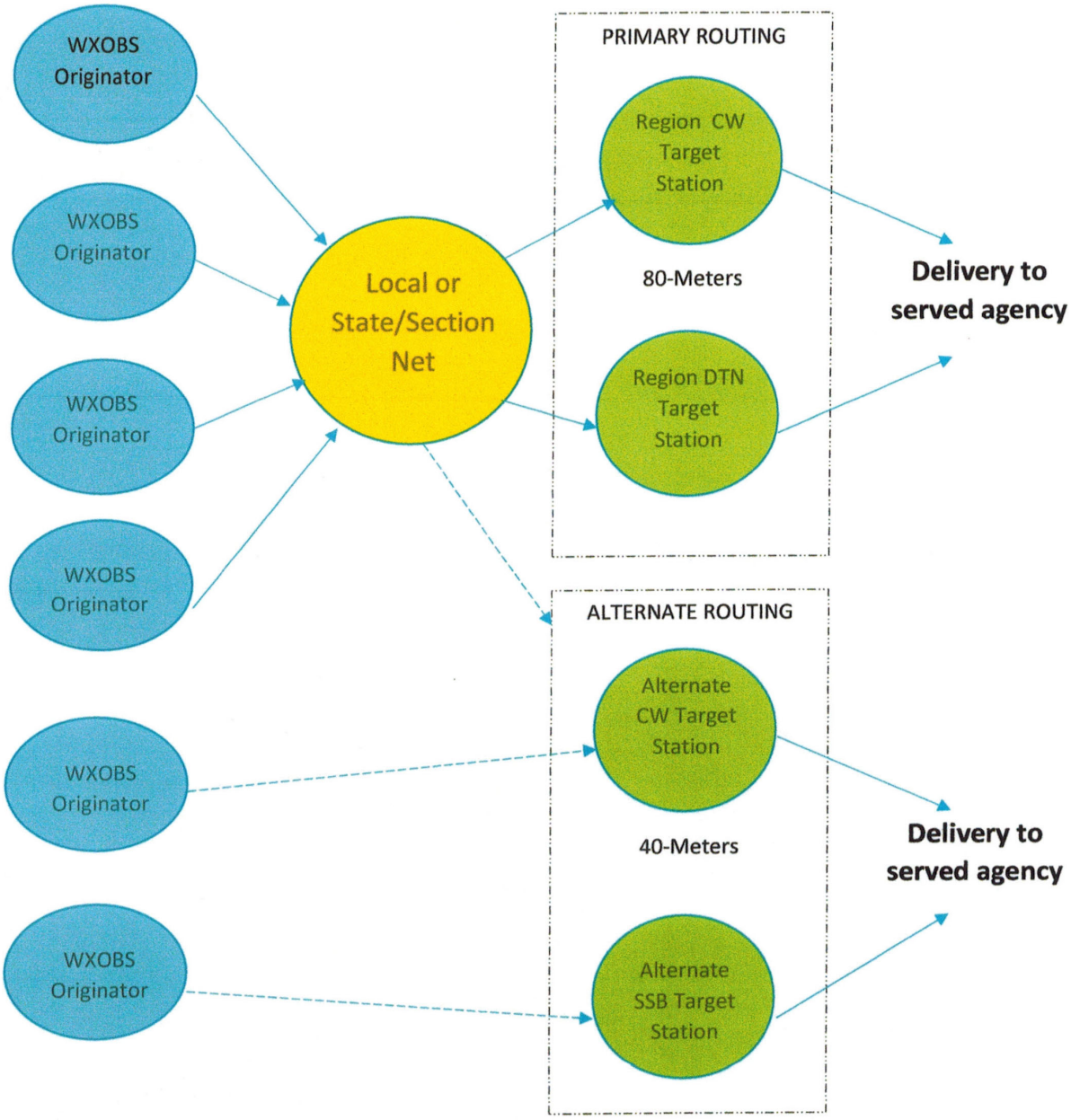
Designator	Frequency	Region	Notes
RAA	3598 KHz	1	September 20Z
RAB	3565 KHz	2	September 20Z
RAC	3557 KHz	3	September 20Z
RAD	3567 KHz	4	September 16Z
RAF	3563 KHz	5	September 16Z
RCA	7115 KHz	Alternate	CW Alternate
RCB	7232 KHz	Alternate	SSB Alternate

Observation Schedule

UTC Date	Local Date	Region	Weather Observation Schedule
Sept. 16	Sept. 15	4	0001Z, 0100Z, 0200Z, 0300Z
Sept. 16	Sept. 15	5	0030Z, 0130Z, 0230Z, 0330Z
Sept. 20	Sept. 19	1	0001Z, 0100Z, 0200Z, 0300Z
Sept. 20	Sept. 19	2	0015Z, 0115Z, 0215Z, 0315Z
Sept. 20	Sept. 19	3	0030Z, 0130Z, 0230Z, 0330Z

1. See RRI Net Directory in the RRI National Response Plan Appendix I, page 62
2. Exerise activation bulletin issued approximately 48 hours will provide DTS and Cycle 4 target station data.

EXERCISE NETWORK TOPOLOGY DIAGRAM



IMPORTANT!

1. Primary routing will be via local/state/section net to Region CW or DTN target.
2. Target station will be responsible for collecting data and delivering to served agency.
3. Alternate route from local/state/section net is to 40-meter alternate target stations.
4. If your local/state/section net is not participating, you may take your WXOBS message directly to the region target (CW or digital) or, if inaccessible, the 40-meter CW or SSB target.

Manual mode target stations will periodically announce their presence on the frequency, particularly at the top and bottom of the hour. For example:

"RRI RRI de W6RRI QSX WXOBS K."

Likewise, those holding WXOBS traffic may call for a target station. For example:

"RRI RRI de K8QMN QTC WXOBS 3 K."

Additional Guidance:

1. Those transmitting messages via voice or CW are reminded to leave a slight additional space between groups in the radiogram text to improve reliability and eliminate confusion.

2. All WXOBS messages should using the "test priority" precedence, abbreviated "TP" on CW or digital.

3. The Winlink-RRI Radiogram Form will NOT be utilized for this exercise.

4. Please note that region CW traffic nets will operate as normal at 7:45 and 9:30-PM local time. Please accommodate these routine net functions and try to accommodate scheduled nets.

5. **Important: The call signs and DTN addresses for target stations will be announced in a simulated RRI emergency activation bulletin approximately 24 to 48-hours before the exercise. Exercise details may be subject to change depending on staffing availability.**

Phase One Observation Schedule – September 16 (September 15 local time):

Region 4: On the hour at:	0001Z, 0100Z, 0200Z and 0300Z
Region 5: On the half hour at:	0030Z, 0130Z, 0230Z and 0330Z

Phase Two Observation Schedule - September 20 (September 19 local time):

Phase two simulates a New England hurricane affecting *Regions 1, 2 and 3.* Weather observations are requested on an hourly basis throughout the three regions as follows:

Region 1: On the hour at:	0001Z, 0100Z, 0200Z, 0300Z
Region 2: On the quarter hour at:	0015Z, 0115Z, 0215Z, 0315Z
Region 3: On the half hour at:	0030Z, 0130Z, 0230Z, 0330Z

Real-Time Weather Data:

Participants should report real-time weather data. While the exercise simulates a tropical storm event, the use of real-time weather data will allow exercise evaluators to obtain insights regarding the accuracy of amateur weather station measurements through comparison to synoptic conditions and data received from nearby weather stations of known accuracy. This overall picture will provide useful insights into the quality of data provided by the consumer-grade weather stations commonly used by amateur observers.

Network Frequencies and Structure:

Important:

Please RSVP to the RRI Emergency Manager if you plan to participate in the exercise. Likewise, net managers who plan to activate their local or section nets during the exercise are also asked to RSVP.

Exercise Conclusion

At the conclusion of the exercise, please send copies of all exercise messages originated to:

Radio Relay International – 4th Quarter Exercise Data
C/O Emergency Preparedness Services, LLC
PO Box 43
Niles, MI. 49120

Participants are encouraged to include a brief narrative describing their experiences and any lessons learned during the exercise.

Questions about this forthcoming exercise may be directed to the RRI Emergency Manager at:

james.wades@radio-relay.org

RADIOGRAM

via Amateur Radio

NR	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME (UTC)	DATE (UTC)
3	TP		W5WE	8	BEEVILLE TX	0100Z	SEP 16

ADDRESSEE

NAME: W6RRI

STREET ADDRESS: Richmond TX 77406

CITY, STATE, ZIP:

TELEPHONE / EMAIL:

OP NOTE:

DELIVERED BY

DELIVERY TIME & METHOD:

OPERATOR NAME: TELEPHONE or EMAIL:

STATION LOCATION or ADDRESS:

RADIO RELAY INTERNATIONAL is an IRS 501(c)(3) non-profit corporation dedicated to the relay and delivery of radiogram messages. Unpaid amateur radio operators volunteer their equipment, time and skill to operate and maintain the radio networks that make this service possible. Learn more at www.radio-relay.org.

BODY TEXT

NON-CASE SENSITIVE COMMUNICATIONS; TYPE USING ALL CAPS

WXOBS 1/KBEA 2/180/15/20 3/TCU 4/84
5/1015R5 6/NONE 7/ZERO

SIGNATURE

NAME	POSITION	ORGANIZATION
HALL		

REPLY VIA

RADIO OPERATOR NAME	ADDRESS OR LOCATION	TELEPHONE / EMAIL

TRACKING DATA

RECEIVED FROM	NETWORK DESIGNATOR	TIME RECEIVED(UTC)
SENT TO	**NETWORK DESIGNATOR**	**TIME SENT(UTC)**
W6RRI	5RN	0107Z

RRI FORM 1801 rev 1

RADIOGRAM

via Amateur Radio

NR	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME (UTC)	DATE (UTC)
3	TP		W5WE	8	BEEVILLE TX	0100Z	SEP 16

ADDRESSEE

NAME: W6RRI

STREET ADDRESS: RICHMOND TX 77406

CITY, STATE, ZIP:

TELEPHONE / EMAIL:

OP NOTE:

DELIVERED BY

DELIVERY TIME & METHOD:

OPERATOR NAME: TELEPHONE or EMAIL:

STATION LOCATION or ADDRESS:

RADIO RELAY INTERNATIONAL is an IRS 501(c)(3) non-profit corporation dedicated to the relay and delivery of radiogram messages. Unpaid amateur radio operators volunteer their equipment, time and skill to operate and maintain the radio networks that make this service possible. Learn more at www.radio-relay.org.

BODY TEXT

NON-CASE SENSITIVE COMMUNICATIONS; TYPE USING ALL CAPS

WXOBS 1/KBEA 2/180/15/30 3/TCU 4/84
5/1015R5 6/RAIN 7/0R13

SIGNATURE

NAME	POSITION	ORGANIZATION
HALL		

REPLY VIA

RADIO OPERATOR NAME	ADDRESS OR LOCATION	TELEPHONE / EMAIL

TRACKING DATA

RECEIVED FROM	NETWORK DESIGNATOR	TIME RECEIVED(UTC)
SENT TO	**NETWORK DESIGNATOR**	**TIME SENT(UTC)**
W6RRI	5RN	0107Z

RRI FORM 1801 rev 1

RADIOGRAM

via Amateur Radio

NR	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME (UTC)	DATE (UTC)
3	TP		W5WE	8	BEEVILLE TX	0100Z	SEP 16

ADDRESSEE

NAME: W6RRI

STREET ADDRESS: RICHMOND TX 77406

CITY, STATE, ZIP:

TELEPHONE / EMAIL:

OP NOTE:

DELIVERED BY

DELIVERY TIME & METHOD:

OPERATOR NAME: TELEPHONE or EMAIL:

STATION LOCATION or ADDRESS:

RADIO RELAY INTERNATIONAL is an IRS 501(c)(3) non-profit corporation dedicated to the relay and delivery of radiogram messages. Unpaid amateur radio operators volunteer their equipment, time and skill to operate and maintain the radio networks that make this service possible. Learn more at www.radio-relay.org.

BODY TEXT

NON-CASE SENSITIVE COMMUNICATIONS; TYPE USING ALL CAPS

WXOBS 1/KBEA 2/MM 3/TCU 4/84
5/1015R5 6/RAIN 7/0R13

SIGNATURE

NAME	POSITION	ORGANIZATION
HALL		

REPLY VIA

RADIO OPERATOR NAME	ADDRESS OR LOCATION	TELEPHONE / EMAIL

TRACKING DATA

RECEIVED FROM	NETWORK DESIGNATOR	TIME RECEIVED(UTC)
SENT TO	**NETWORK DESIGNATOR**	**TIME SENT(UTC)**
W6RRI	5RN	0107Z

RRI FORM 1801 rev 1

Radio Relay International

WXOBS Report Form

Ref. RRI *National Emergency Communications Response Plan* Appendix A, Example 7

MSG NO.	STATION	LOCATION	TIME (Z)	CWA	METAR	WIND	CLDLYR	TEMP (F)	BAR (mb)	PRECIP	
1	W6RRI	RAPID RIVER MI	051630Z	NWS MQT	KESC	180/25/50	OVC	22	1003.1	21/0.20	Winter Example
2	W6RRI	RAPID RIVER MI	051630Z	NWS MQT	KESC	270/35/44	TCU	83	1015.3	0.93	Summer Example

SEPTEMBER 2020 EMCOMM EXERCISE CHECKLIST

Use this checklist to prepare for the September RRI Exercise

BACKGROUND

- ☐ Review National Response Plan Chapter XVI
- ☐ Review National Response Plan Appendix H
- ☐ Review and practice formatting WXOBS message described in National Response Plan Appendix A, Example 7
- ☐ Familiarize yourself with RRI Net Directory.
- ☐ Review NSOS/Neighborhood Hamwatch Training Slides TR-003 and National Response Plan Chapter XIV
- ☐ Consider incorporating REACT, VOADs, and local sources in your preparations.

PREPARATION

- ☐ Inspect your personal weather station and ensure its properly calibrated.
- ☐ Ensure you and your station facilities are prepared
  - Antenna systems can withstand severe weather condition.
  - Transceivers and amplifiers work reliably.
  - Emergency power system(s) (generator or float cells) are in good condition.
  - Have radiogram or radiogram-ICS213 message blanks available.
  - If appropriate, test UHF FRS/GMRS coverage with cooperating VOADs, scouting groups or similar.
  - Practice transmitting some test WXOBS messages on your local/state/section traffic net.
  - Identify your Digital Traffic Station or Cycle 4 Region Liaison stations.
  - Review exercise plan to identify DTS and CW target stations for weather data.
- ☐ **If a personal weather station is not available**, reach out to a nearby source to arrange for weather data. Many radio amateurs, fire stations, small local airports and even local weather enthusiasts maintain weather stations. Explain that you are participating in an RRI disaster exercise simulating a tropical storm event with associated internet and cellular data outages.
- ☐ Encourage fellow traffic operators and EmComm unit members to participate.

DAY OF EXERCISE

- ☐ Observe reporting schedule. Observations in each RRI region involved is keyed to a time sequence.
- ☐ **Digital Stations:** Proof-read your messages carefully. Be sure they include proper target station and zip code.
- ☐ **Voice and CW stations:** Proof-read your messages carefully. Transmit them slowly with plenty of room between groups.
- ☐ **Local/Section Nets:** Ensure that liaisons to the region net or Digital Traffic Net (DTN) are in place.
- ☐ Remember that traffic is "Test Priority" and therefore time sensitive. Follow the suggested routings.
- ☐ **WXOBS target/liaison stations:** You are responsible for collecting the data and populating the spreadsheets.
- ☐ Be prepared to use alternate modes or frequencies depending on RF propagation conditions or interference.
- ☐ At conclusion, organize copies of all messages originated and send them to:

  Radio Relay International
  C/O Emergency Preparedness Services, LLC
  PO Box 43
  Niles, MI. 49120

RADIO RELAY INTERNATIONAL RELEASES REVISED NATIONAL EMERGENCY COMMUNICATIONS RESPONSE GUIDELINES EFFECTIVE AUGUST 1, 2020

Important Announcement:

Radio Relay International has released revised *National Emergency Communications Response Guidelines*. This updated version is effective August 1, 2020.

This latest revision is based on exercise evaluation results obtained over the past two years as well as feedback from various stakeholders such as RRI, ARES and REACT volunteers, served agencies and partner organizations. Of particular importance is some minor modifications to the standard message formats defined in the plan, such as the OPRED, SITREP and WXOBS message formats.

These national response guidelines are designed to provide a reasonably open architecture. The goal is to obtain a balance between maximum flexibility for local and state nets, while implementing a systematic response methodology at the region, area and International levels. This allows affiliated nets at the local and state level to tailor their approach based on the requirements of cooperating EmComm organizations while simultaneously working within the traffic system to accomplish a variety of unified outcomes:

1. Ensuring adequate circuit capacity is available to facilitate timely message propagation through the system.
2. Ensuring mechanisms are in place to allocate net resources and establish routings that are responsive to major disaster operations.
3. Ensuring that networks are accessible to support small local EmComm groups, VOADs or individual operators who may not have access to a fully functional local emergency communications unit or a functional traffic network.
4. Inculcating standardized methods, which can be implemented at all levels of the system.

The emergency plan is available for download at:

http://radio-relay.org/wp-content/uploads/2020/08/RRI-NECRP-2020-8-1-Final-Approved.pdf

MENTORS NEEDED

The success of Radio Relay International has resulted in a number of requests for training in the art of traffic handling. We would like to develop a cadre of individuals who are willing to work one-on-one with new traffic operators. The goal is to provide these students with encouragement, explain and demonstrate procedures and so forth. This can be done over a video call, on-air, or over the phone. If you can help, please enroll as an RRI mentor. Send an e-mail to info@radio-relay.org

Radio Relay International
Merchandise Order Form

Mail to: Radio Relay International
C/O Emergency Preparedness Services, LLC
PO Box 192
Buchanan, MI. 49107
(833) 377-0722

If ordering via Pay-Pal, specify desired items and quantity along with total.
The RRI PayPal address is: james.wades@radio-relay.org

Name:_____ Call Sign:_____

Address:_____

_____

City:_____ State:_____ Zip Code/Postal Code:_____

Telephone:_____

Note: Overseas radio operators should contact us for a shipping quote when ordering

RRI Logo embroidered ball cap: (stock number 1192001)	$19.50	Quantity:_____	Subtotal:_$_____
RRI "Radiogram Enclosed" rubber stamp: (stock number 1196372)	$13.00	Quantity:_____	Subtotal:_$_____
RRI "Radio-Telegram Enclosed" rubber stamp: (stock number 1196369)	$15.00	Quantity:_____	Subtotal:_$_____

Shipping via USPS:

Rubber stamps (up to a quantity of 4)	$ 7.00	Subtotal:_$_____
Ball Cap (up to a quantity of 4)	$ 15.00	Subtotal:_$_____

(note: rubber stamps can be included with ball cap(s) at no additional shipping charge)

Total: $_____

Make check payable to "Radio Relay International"

QNI NEWSLETTER

C/O Emergency Preparedness Associates, LLC
PO Box 43
Niles, MI. 49120
(833) 377-0722 option 4

Editor: James Wades (WB8SIW)
Email: jameswades@gmail.com
Tel: 833-377-0722 x 700

Assistant Editor: Kate Hutton (K6HTN)
Email: katehutton@gmail.com

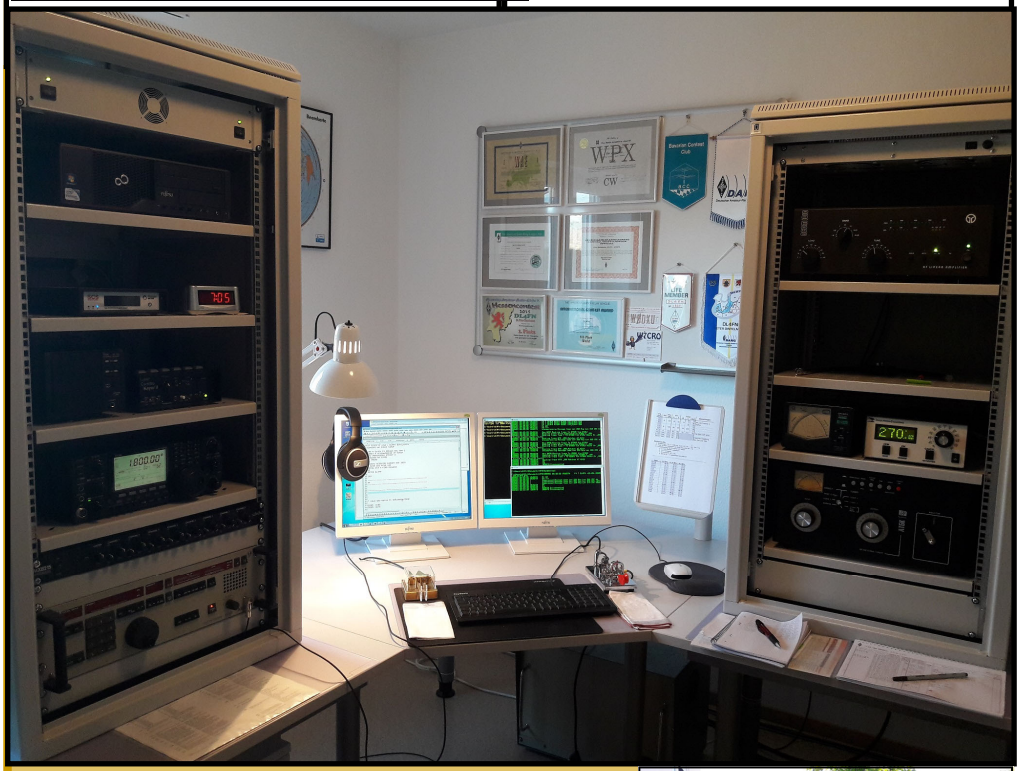
An Independent Newsletter

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

Promote RRI

Order your Radio Relay International ball cap today! Wear it with pride at radio club meetings, ARES events and public service activities. Order form on page 18.

Do you occasionally deliver radiograms by hand or mail copies via USPS? Order the RRI "radiogram enclosed" or "radio-telegram enclosed" stamps. Order form on page 18.



Above: The elegant and well organized radio shack of Peter Dintelmann (DL4FN) or Erbach, Germany. Peter operates an important EU digital MBO as part of the RRI Digital Traffic Network and he is active in other phases of the traffic system. He is perhaps best known for the welcome radiograms originated to new radio amateurs in the United States. Send us a photo of your shack