BREAKING NEWS! - FEMA AND NTS

As this issue of "QNI" was being finalized for publication, the Federal Emergency Management Agency reached out to NTS regarding the possibility of utilizing our networks as a supplemental nationwide messaging layer during significant "grid-down" scenarios.

These discussions are in their early stages, but they speak to a renewed interest in standardized, systematic messaging at the national level. In addition, High Frequency radio is again being identified as the "weapon of choice" during major disasters.

Commercial and government contractors are also stepping into the HF arena to provide the very services that have largely been neglected by the Amateur Radio Service in recent years. This should be a loud and clear message to those who have suggested that NTS facilities are irrelevant.

This issue of QNI was intended to be a special "Standby Power Issue." Due to breaking news regarding NTS and FEMA, we have added important information

Please read the coverage starting on page 11 and spread the word to your friends in ARES and NTS. **We have a work to do in the coming months!**

VOLUME 4, ISSUE 3

In this issue:

Autumn Issue

QNI MISSION STATEMENT

QNI is an *independent* newsletter dedicated to promoting NTS and 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 the *ARRL*, the National Association for Amateur Radio, nor those of any particular NTS net or emergency communications organization.

Our mission is to provide a forum for NTS 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.

Portable Generators for EMCOMM Preparedness

How many of us have a generator sitting in our garage or storage shed awaiting use in time of emergency?

I recently pulled my generator out for its periodic test. Despite the fact that it is now just over 35 yr old, it started on the first pull, just like it always has. The voltmeter indicated a nice, stable, 125 volts and it functioned fine under the load of an electric space heater running at 1500 watts.

Considering the fact that I have not exercised it regularly, my old "Homelite" generator, with it's Briggs and Stratton engine, seems to be the poster child of reliability. Nonetheless, I decided it was time to take generator maintenance a bit more seriously. It seemed a good place to start was by making some preparations for testing the unit on a more frequent basis, as well as adding some outboard features to protect the generator.

Monitoring the load:

My old generator as originally manufactured is not equipped with any metering, circuit breaker or fuse. Therefore, it was time to implement a method for monitoring the output and load on the unit. A search on eBay showed a Barnett Instrument Company "power tester" was available for auction. This is an older electrical instrument incorporating a voltmeter and ammeter, the latter also being calibrated in watts. The power tester plugs into the power source and provides an outlet on the side of the test device for connecting a load. It's essentially a short extension cord with a voltmeter, ammeter and 15-amp fuse wired into the circuit. My bid was successful at a reasonable price.

Upon arrival, the power tester device was opened up and a few modifications were made. Because the generator might

Old "power tester" device displays both line voltage and current / watts being drawn from generator.

conceivably be used to power a portable high frequency radio station, RF seeking ground via the power line could be an issue. Therefore, I installed two 0.01 mF bypass capacitors across each meter to protect them from any transient RF, which might damage the meter movements while seeking ground through the AC line.

The older instrument was also designed for two-wire service. Therefore, a modern three-wire grounded cord was installed and the safety ground was bonded to the power-tester chassis and output socket on the side of the instrument. This provides a safety ground for any connected device, which will then pass through the circuit tester in conformance with good safety practice.

Safety Ground:

The generator itself can be grounded when in use. A short, temporary ground rod was built in the form of a "T," which allows

A short ground rod is often sufficient for a temporary installation. A longer ground rod may be required for sandy or rocky soil

one to push a ground rod into the soft soil without the use of a hammer. A long "jumper" with a battery alligator clip was then constructed to connect the generator ground to the temporary "push-in" ground rod. This provides a basic level of grounding for the equipment. One could also use the jumper to connect to an existing AC mains safety ground, cold-water pipe, or the like, if available.

A fused disconnect:

While the power tester is fused, I wanted something a bit more permanent and somewhat more "fool-proof." Because my generator is of an older design, no circuit breaker or fuse was incorporated in the generator itself. Therefore, I found an old 30-amp

fused disconnect, of the type that uses the traditional plug fuse. This device has the advantage that the load can be disconnected from the generator output simply by throwing a lever, without the need for unplugging anything in the event of an emergency. If I am not available, and the generator is needed, the non-technical user need not rely on the somewhat more complex power tester for monitoring. Instead, the generator will be protected by the fused disconnect.

With these improvements, a basic level of protection for the generator is available, and I am now capable of monitoring the voltage output and load on the generator while it is in use.

Norbert Shemansky?

My generator, as originally designed was best carried by two men. A carrying handle was installed for this purpose (now removed) and for years, I have simply picked it up and moved it around by myself. These days, I have a bit less energy and strength so a new solution was sought.

A visit to several retailers revealed a small garden utility cart was on sale at "Rural King." Even more good fortune smiled upon

Generator mounted to garden cart. The sides fold-down for easy access for generator maintenance. The cart also works nice for transporting accessories. Note disconnect switch fused for 15-amps

me when I realized that only the display model was left. Not only did I get a new cart, but I didn't have to assemble it. What a deal!

A large piece of 3/4 inch pine was cut to match the tray of the garden cart. It was then painted OD green and the generator was bolted through the wooden base and the cart. The disconnect switch was then mounted next to the generator. Loose items, such as the power-tester, adapter cables, ground rod and jumper and extension cords can be easily transported with the generator. Even with the cart, two men can easily lift the generator and place it in the back of a SUV or pick-up truck.

This old generator still works quite well, and while it is not as quiet or efficient as some of the newer models, it has proven incredibly reliable over the years, having been used for both business and occasional emergencies, to power both communications equipment and home appliances.

Generator Maintenance

It's not enough to simply purchase a generator and leave it in the garage. ARES and NTS members should consider the following maintenance and safety requirements:

- The generator should be tested regularly. Starting the generator once a month or at least once a quarter is recommended. Some older generators will lose field excitation if not run for a long period of time and will therefore need to be "flashed" to restore operation. It's far easier to simply run the unit periodically.

- Do not leave old fuel in the generator. One can run the fuel out before storing the generator, or fill the tank and add a fuel stabilization product such as "Sta-bil."

- Test the generator periodically under load. A couple of 300-watt incandescent lamps or a small space heater will provide plenty of load to ensure proper operation. Monitor the AC line voltage both off-load and under load to ensure that it remains in a safe operating range. Some older generators will creep above 130 volts or more when load isn't present. Today's sensitive electronic devices may not tolerate such voltage fluctuations.

- Before buying a generator, use an oscilloscope or scope meter to observe the waveform. Some inexpensive generators do NOT produce a clean sine-wave. The voltmeter may read 120-volts, but the leading edge of each cycle may far exceed the desired maximum voltage. Beware of "bargain" generators, which may be suitable for powering an electric drill or space heater, but which can spell doom for modern solid-state electronics. Remember that one "gets what one pays for."

- Store sufficient fuel for several days duration. Invest in one or two high quality "safety cans" to store your gaso-

Generators (continued from page 2)

This waveform is from the Homelite Generator shown in the article. The photo was taken with no load and shows a reasonably serviceable sine wave. Under load the noise smooths out considerably and the AC waveform improves. AC frequency measured at 59.9 Hz.
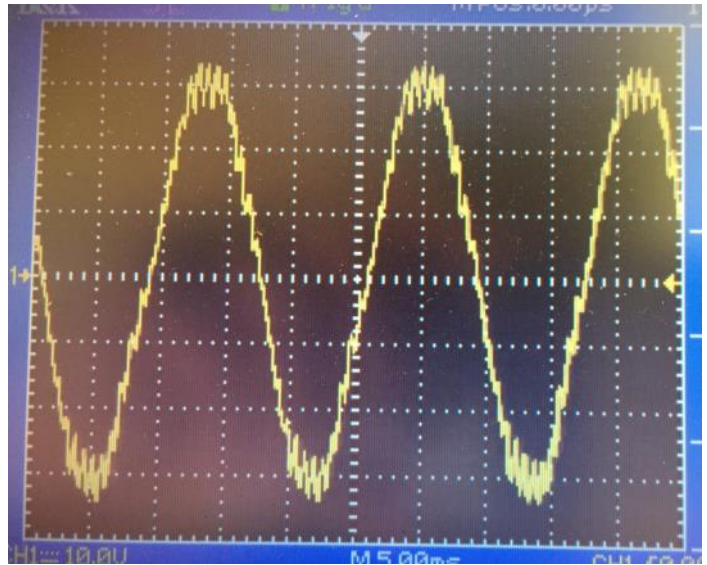
Examples of gasoline safety cans. Can you guess which one I have owned the longest? Whether old or new, the safety can is the right choice for storing or transporting gasoline.

line. These are worth every penny and they will last a lifetime. Be sure to cycle your emergency fuel through your lawn tractor, snow-thrower or automobile. Old fuel is a reliability problem waiting to happen. *Remember that in time of emergency, your local service station may not be able to dispense fuel.*

- Perhaps it goes without saying, but exercise safety precautions. Do not operate the generator indoors. When using a portable generator, a good rule of thumb is that it should be located at least 20-feet from living quarters. Do not refuel portable generators while they are operating and keep the generator and flammable materials isolated. Areas at risk for wild fires may require the use of a generator equipped with a spark arrestor.

- Finally; remember that the generator is a portable "power house" capable of providing a lethal shock if utilized improperly. The combination of floating 110 or 220-VAC, damp ground and wet shoes can prove dangerous if proper safety precautions are not observed. While codes do not require that one ground a generator, it may be wise to do so anyway.

Simulated Emergency Test is coming in October. Why not get your generator ready. Exercise it, ensure sufficient fuel is available and then put it to work during SET by powering your station while participating in traffic nets, ARES functions and the like. Once it is fully tested and maintained, one can rest assured that it is ready for the next exercise….or the real thing.
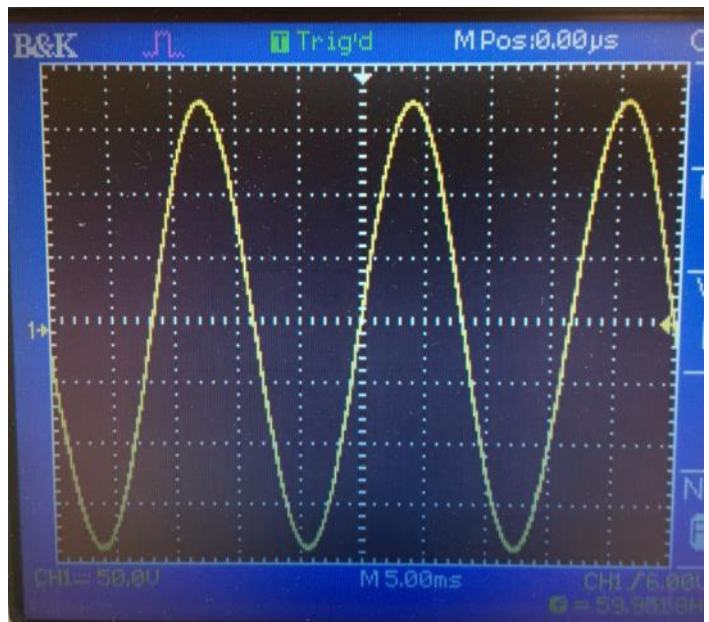
This waveform is from a modern Honda eu2000i inverter generator. The waveform is without load. Quality built, modern generators offer the advantages of true sinewave output and good voltage regulation. Lower RPM engines last longer and run quieter than the older portable power generators. AC frequency measured at 59.9 Hz.

Improving Skywarn Networks
by James Wades, WB8SIW

The "Skywarn Net" has been a staple public service program within ARES for decades now. Despite recent improvements in remote sensing technology, there remains no substitute for "ground truth" weather observations.

Today, the National Weather Service receives numerous reports of severe weather via social media and other Internet resources. However, such reports, while occasionally valuable for verification purposes, are nonetheless random in nature, and many such sources offer little in the way of quality control.

Amateur Radio Emergency Service (ARES) resources continue to offer significant advantages for collecting real-time observations of severe local storms. A dedicated cadre of trained volunteers ensures coverage of a County Warning Area (CWA) and trained observers provide assurance of a basic level of quality control. Such networks also continue to function during internet disruptions or cellular data network failures.

Despite these important advantages, some Skywarn networks occasionally exhibit certain deficiencies that degrade their performance. Here are a few examples:

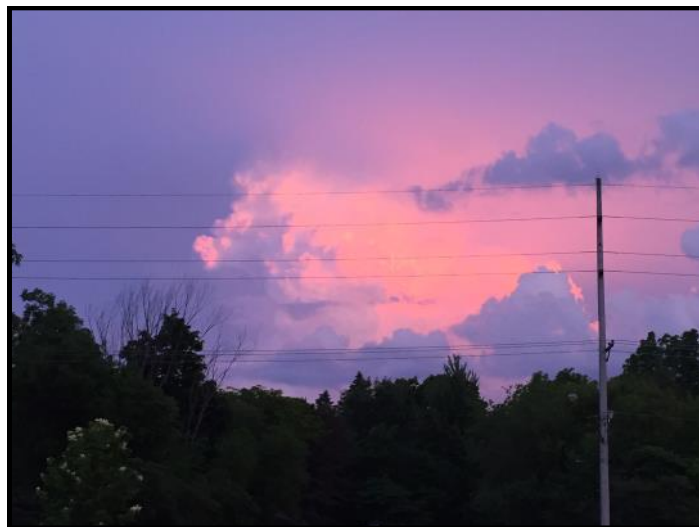*The basement observation post:*

How often have you heard an ARES member report weather conditions from his basement ham radio shack? It happens surprisingly often. In reality, effective weather spotting usually requires that one get in his automobile and position himself in a location offering a clear view of approaching storms. Few of us have a panoramic view of the horizon available through our family room picture window, much less from the basement.

While storm configurations and direction of movement vary, the classic configuration of a tornadic storm typically requires that one position oneself within the inflow boundary looking west or northwest toward the rain-free base of the supercell thunderstorm. This position allows one to see the area where the updraft core within the mesocyclone meets the rear flank downdraft, as it wraps around the Southwest edge of the storm.

The observer should have knowledge of storm location and movement throughout the event. This allows him to reposition himself as storms develop, based on changing environmental conditions. RADAR images, delivered via a mobile device (tablet, smart phone, etc.), may be utilized. Likewise, a skilled net control operator can summarize storm movement and location and broadcast this information on the Skywarn net. One should keep in mind that cellular data networks may slow or fail, if significant severe weather damage occurs.

"It's raining over here!"

How often has one heard an observer report "torrential rain" or "gusty winds?" Such information is redundant. Not only does modern weather RADAR provide a fairly good picture of such events, but one can also safely assume that rain and gusty winds are the natural byproducts of a strong thunderstorm. Generally, only certain weather phenomenon are of interest to the meteorologist:

- **Winds greater than 50-knots (57-mph).** This remains the threshold wind speed for issuing a Severe Thunderstorm Warning. Winds below this speed are of minimal concern.

- **Hail in excess of 3/4 inch in diameter.** While some NWS offices set a reporting threshold of smaller diameter, 3/4 inch hail remains the default criteria for the issuance of a Severe Thunderstorm Warning.

- **Wall Cloud:** The wall cloud is defined as an isolated lowering of the rain-free base, roughly one to three miles in diameter, which exhibits *inflow, rotation, persistence and organization.* A wall cloud should always be reported. However, spotters often confuse shelf clouds, located at the outflow boundary of a thunderstorm (such as the gust front) with a tornadic wall cloud, which is associated with the rotating updraft of a supercell storm. *Observers should be cautioned to observe cloud features carefully.* Proper training should explain how to differentiate between a shelf cloud and wall cloud, based on how these features are juxtaposed with overall storm structure.

- **Funnel Cloud:** Perhaps it goes without saying, but a funnel cloud is defined as a violently rotating column of air, which is <u>not</u> in contact with the ground. A funnel cloud should always be reported. Again, observe carefully and do not confuse scud clouds or rain shafts with either funnel clouds or tornadoes (see below).

- **Tornado:** Of course, a tornado, defined as a "violently rotating column of air in contact with the ground," should always be reported.

Outside of such key storm features, one can assume that other

events are naturally associated with a vigorous or severe thunderstorm. These include lightning, torrential rain, small hail, gusty winds and the like.

"Oh my! What a scary cloud!"

The shelf cloud, often located at the leading edge of a storm can be very impressive in appearance. Nonetheless, the presence of a well organized shelf cloud does not guarantee that a storm will be severe. Ahead of a shelf cloud, one will typically experience straight line winds blowing out ahead of the storm in association with the downdraft. *It is the speed of these winds that is important.* As stated earlier, if one observes a well organized storm approaching, the shelf cloud need not be reported, but straight-line winds in excess of 50-knots *should be* reported to the NWS.

A standard message format.

Observations should be transmitted in a standardized fashion. This allows the NCS or the National Weather Service liaison station to quickly and efficiently log each report without confusion.

One need not use a complete message format, such as ICS-213 or radiogram. Rather, it is important to simply provide the basic information about the observation in a repeatable order. For example, one might use the "TEL" format" Time-Effect-Location. Consider the following hypothetical report:

"At 345 PM a Wall Cloud at Sixth and Congress downtown Austin."

There is nothing special about this abbreviated message format. The idea is to provide the basic data in the same sequence so that the NCS and key stations can anticipate the sequence of information, thereby minimizing confusion. For example, envision a NWS liaison station recording observations on a spreadsheet or message forms for transfer to the Warning Coordination Meteorologist. Would it not be easier to do so if the same reporting sequence was used by every observer?

After the storm:

Warning verification is important as well. Observers should report significant storm damage, flooding and storm-total precipitation measurements in excess of one inch. The latter information is helpful for enhancing hydrological models. It is easy to forget that flooding can be a "long fuse" event. It may take some time for precipitation to propagate through a watershed before flooding occurs. More precipitation data enhances hydrological model accuracy, thereby improving the accuracy of flood warnings.

Weather Stations:

Observers can also install a good quality rain gauge or even an automated APRS weather station to enhance the quality of their reports. Sometimes, such enhancements lead to a secondary hobby of weather observing. Weather instruments need not be "high tech." Good quality manual rain gauges accurate to one hun-

dredth of an inch are inexpensive and older meteorological instruments such as microbarographs and event recorders can often be purchased at bargain prices.

Summary:

Like so many areas of amateur radio public service, it is easy to be lulled into complacency by the idea that cellular mobile data networks and the Internet have diminished the importance of Amateur Radio resources. Even when such resources remain fully operational, there is no substitute for the value-added features of an effective ARES program and Skywarn Net, not the least of which is a reliable source of volunteer observers and the high level of quality control that goes with training, standardized communications procedures, and the advantages of the intercommunications features of a radio network.

-30-

More on ARES—NTS Cooperation
By James Wades, WB8SIW

Local ARES groups that fail to develop a relationship with NTS are missing out on a valuable resource. Consider the typical NTS traffic net. Many section NTS Nets have anywhere from 20 to 50 volunteer operators on frequency for any given net. Some participate on a daily basis, some only occasionally, but all are typically scattered throughout a state.

Next, consider the concept of "last mile" of connectivity. When one needs to establish a link between a location without working communications infrastructure, and someone outside the affected area, the location of the operator on the other end of the circuit really doesn't matter. Toll-free calling, unlimited e-mail capability and the like are all commonplace today.

Now, consider the fact that this additional cadre of individuals are available to serve as a point-of-contact on behalf of served agencies. Best of all, the use of this resource places no drain on local ARES volunteer resources. Does it not make sense to include it in one's planning and use it as a supplemental resource?

NTS is, of course, built on a somewhat different model than ARES. Nonetheless, the plan was for the two organizations to work together. Regular liaison between the local ARES group and NTS should be the goal of every ARRL Emergency Coordinator. For example, one can appoint an "Assistant EC – NTS" whose primary responsibility would be to arrange for and coordinate daily representation of the local ARES group on one or more section NTS nets. By doing so, the ARES group builds essential personal relationships to cement cooperation between the two organizations. These relationships will naturally enhance cooperation between the programs and ensure additional resources are available in time of emergency. Likewise, NTS could assign liaisons to weekly ARES nets, and perhaps even

deliver traffic destined for regular ARES members.

NTS liaison could certainly be shared between several ARES groups. For example, several counties in a metropolitan area could identify a few key volunteers who would represent the combined ARES groups on section NTS nets on a daily basis. Likewise, the several ARES groups could work with NTS volunteers to build a NTS Communications Emergency Response Team ("NCERT" – see article entitled "NTS and FEMA on page 11).

ARES organizations often overlook the potential value of the NTSD (digital) and WinLink 2000 (WL2K) networks. The same high frequency transceiver and PACTOR modem allows access to both networks. By equipping an EOC for access to these automated digital networks, one gains access to a "turn-key" automated communications infrastructure that places few demands on local volunteer resources. WL2K can be used to transmit e-mail messages and limited binary file attachments to similarly equipped (and registered) stations. NTSD allows a key station to transmit and receive radiogram or ICS-213 message traffic using the same equipment. Your EOC, with a high frequency transceiver and PACTOR modem, can be registered as a Digital Relay Station (DRS) and thereby gain access to a nationwide, automated communications network (NTSD) that is ready to go!

Neither NTS members nor ARES members should see the other program as "competition." Rather, radio amateurs should be thinking about how to work together in order to leverage all available volunteer resources in the most efficient manner possible. There is absolutely nothing to be gained through the maintenance of an ongoing dichotomy between the two programs; but there is much to be gained through cooperation in the form of additional communications paths and volunteers for ARES in time of emergency.

If we want ARES to remain relevant in the 21st Century, it is no longer enough to simply show up with a radio. We must be able to provide a high quality, reliable communications service that not only provides value-added features in the form of expertise and administrative skills, but which also continues to function accurately and efficiently "when all else fails."

-30-

Will gasoline be available?
By James Wades, WB8SIW

In the event of a power outage, gasoline may not be available from your local service station. ARES and NTS members who live in areas where disaster can strike unexpectedly should make a point of keeping the automobile tank at least "half full."

If one plans to use a generator to power critical communications equipment, sufficient fuel should be stored to "feed" a generator or other essential equipment. Generators can also be used be used to charge deep-cycle batteries, which in turn can power communica-

tions equipment, thereby limiting generator duty cycle and conserving available gasoline.

Temporal Distortions in the Ionosphere?
By James Wades, WB8SIW

This past April, a NTS member originated a radiogram for delivery to a "Morse Day" celebration at Ferguson, Missouri. He originated it well in advance using the "HXF" handling instruction specifying the desired date of delivery. Nonetheless, it still arrived five days late!

Where does some of this traffic go? Is there a black hole somewhere into which traffic disappears? Is there a TCC sked or digital frequency that serves as a portal to an alternate dimension, where time moves more slowly? Is there some type of temporal distortion ("time warp") in the Ionosphere?

One might argue that the date-time group (date and time of origin) is one of the most important components in a radiogram. Accuracy is likewise important, but let's face it; of what value is a message that takes ten days to reach its destination?

If one finds oneself holding a radiogram with handling instructions HXF-25, would it not make sense to deliver it on the 25th, even if one is holding it at a location 200, 500, or 1000 miles away? After all, the vast majority of people today have toll-free, long distance service. For most of us, delivery to a distant location costs nothing.

In recent years NTS has made great strides promoting a higher quality of traffic and improved accuracy. Perhaps now is the time to address the delivery delay issue. Ultimately, we are in a customer service business, and there are two customers involved in the radiogram process, one of which is the originator and the other the addressee. They deserve prompt routing and delivery of their traffic.

While it is easy to dismiss some routine radiogram content as "unimportant," delivery delays, garbled and incomplete text and other failures nonetheless combine over time to promote a narrative that shouts "NTS can't be taken seriously." It is not just the occasional failure that damages the reputation of NTS, but the aggregate small failures that, over time, add up to degrade our reputation,

NTS critics occasionally ask; "If NTS can't deliver a routine greeting on time, how can it be relied upon to deliver an important message affecting emergency operations or public safety." Perhaps they have a point. Let's get a grip on this problem and improve the quality of our customer service. Our future depends on it. *We should be treating every radiogram like it is important.*

-30-

The Deep Cycle Marine Battery
By James Wades, WB8SIW

Modern solid-state transceivers offer a number of features ideally suited to emergency communications. Most are designed to operate from a 12 to 13.8-VDC power source, and nearly all feature adjustable power output.

By setting the power output level of a high frequency transceiver to 50-watts or less (depending on mode), one can operate for an extended period of time using a deep-cycle marine battery as a power source.

The author regularly operates throughout ARRL Field Day weekend using a transceiver set to 20-watts (CW) RF power output, with the primary power provided by a single lead-acid deep-cycle marine battery. So far, he has never "run out of juice" during the event, despite the relatively high duty cycle associated with operating Field Day.

Thanks to the modern "trolling motor," outfitters such as "Cabela's," "Gander Mountain," "Bass Pro Shop" and smaller sporting goods retailers sell carrying cases designed to transport a deep-cycle marine battery. Many of these cases are fused and some are even metered, with suitable connectors for external equipment. While a bit heavy to lug-around, the average individual can carry a deep-cycle battery a long distance if necessary.

The deep-cycle marine battery has been a regular companion during emergency exercises, camping trips and remote fly-fishing excursions and, of course, emergencies and field exercises. A deep-cycle battery can be charged from solar panels or even an automobile if necessary. They are also very tolerant of abuse.

A Heathkit Fish Spotter?
By James Wades, WB8SIW

In Michigan, there are nearly as many boats as automobiles. Lakes are everywhere and a quality fishery abounds. A visit to garage sales often turns up fishing and camping equipment and other useful items. During one such recent visit, the seller had an old Heathkit "fish spotter" for sale for 5-dollars. A quick negotiation talked the price down to three dollars, and I took it home. Of course, the fish spotter was obsolete by 30 years, long surpassed by much improved methods and accurate liquid crystal displays.

Like any good ham radio operator, I had no intention of using it as a fish spotter. Instead, I wanted the water resistant aluminum case, which appeared ideal for containing a QRP transceiver. The old calibrated eye, still fairly accurate thanks to several teenaged years working in a tool and die shop, estimated the area containing the old display was a perfect width for mounting a small Yaesu FT-817ND QRP transceiver and a matching LDG Z-11 antenna tuner. Fortunately, my visual estimate proved extremely accurate.

At home, the case was placed on the work bench, the old fish spotter display and electronics were removed, and the old corroded battery compartment was disassembled and set aside. The cover for the battery compartment was then repurposed, and mounted within the moveable cover assembly, to form a shelf where the fish spotter electronics used to be located. This simply required the drilling of four suitable holds, two along each side of the cover assembly.

Next, some simple measurements were made for the Z-11 autotuner and FT-817 transceiver. This allowed for a section of the cover assembly to be cut out to facilitate the microphone and headphone connectors and switch on the side of the transceiver.

Once the case was configured properly, it was cleaned and painted with two coats of olive drab paint. This covered any blemishes and gave the entire device a nice "utilitarian" and business-like look, ideal for a portable QRP radio. After the paint dried thoroughly, the DC cabling and RF cables were carefully prepped and the tuner and QRP transceiver were put together as a single unit and mounted to the shelf.

The result is a compact QRP rig and tuner, ideally suited for travel or emergency response.
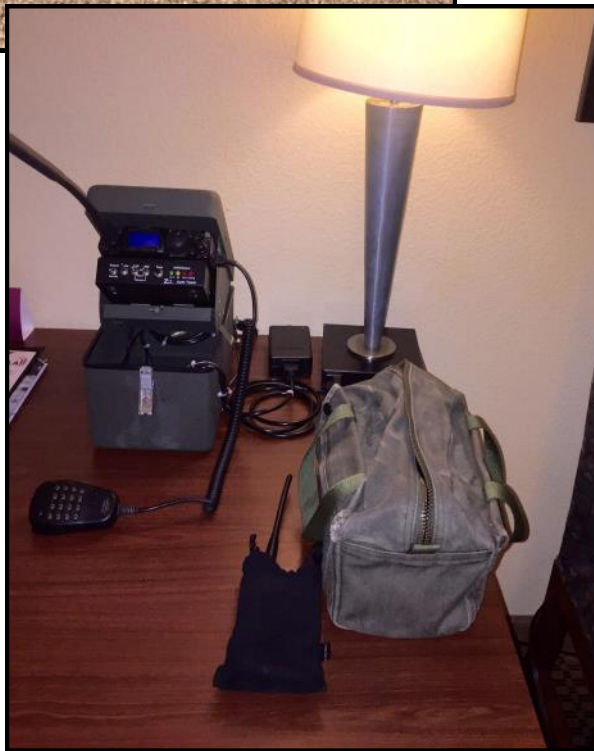
I doubt this article will create a "run" on obsolete Heathkit Fish Spotters, but if one is interested in building a similar project, they regularly turn up on eBay for a small amount. Likewise, radio amateurs in the Great Lakes States can probably find one at a local rummage sale or simply by asking their friends and relatives.

-30-

Top: QRP rig closed for transport. Bottom: The "Fish Spotter" being tested on two meters in a Dallas Hotel Room. The small accessory bag contains a LNR Par "EndFedz" antenna, power supply, Morse keys, microphone and other small accessories.

Abuse of the Message Format

By Kate Hutton, K6HTN

In this article, let's consider the impact of NTSD and radio email on our radiogram format. I think all will admit that the these digital modes have their distinct advantages and go a very long way to making up for the decline in staffing on the manual NTS nets.

On the other hand, in the many service messages and other messages that I pass and receive, I've noticed a somewhat loose adherence to radiogram format coming from the "digital side." Perhaps because it's basically "email," it is conducive to a more relaxed, conversational format. However, we need to keep a clear distinction between email and radiograms. The latter still must adhere to the format. Traffic handlers need to keep in mind that a radiogram may or may NOT always travel via the same mode in which it starts. A DRS may take messages to a local voice net to facilitate deliveries. Lack of a timely local net may cause some even stranger transformations. In southern CA, it is common practice to "position" incoming digital traffic for the most appropriate voice net, but passing it "laterally" on the daily SCN/CW net at the beginning of Cycle 4.

Here is where the presence of punctuation and other non-standard "format enhancements" may cause the op to scratch her head. We are sometimes faced with either lengthening the message by spelling out punctuation in the address or text (or even the preamble!), or by "taking liberties" to change the exact wording.

Perhaps even stranger is the message that has already been significantly altered by the "parser program," when it was loading into NTSD in the first place. So, the well-known Irish traffic op Patrick O'Reilly has become PATRICK O APOSTROPHE RILEY!

It is possible that newly recruited digital operators are not receiving as much training as manual net operators have traditionally received in the past. Perhaps the distinction between radiograms and radio email is blurred in their minds. According to MPG Chapter 6, radio email is, well, email sent over radio, in particular on the amateur bands. Radio email may or may not "carry active radiograms." Nonetheless, radiograms should still adhere to the radiogram format, since they are expected to be usable in other mode as well, without any alterations.

So …

- ".", ",", """, "#", "!", "@" and other cuss-word material should NOT be included in a radiogram. It is up to the originating station to find appropriate alternatives (ATSIGN, APT, NR, DASH, COMMA, etc – if they are in fact necessary – to make the message rock solid against fu-

ture modifications.

- Probably O RILEY or "ORILEY" (which is the way the white pages listing would look) are probably preferable to O APOSTROPHE RILEY.
- For NTS purposes, nine-digit zip codes are unnecessary, especially with DASH in them.
- Handling instructions, if present, should include the HX. For example, use HXG rather than just G. I This particular diversion may come from Flmsg, which is software to supposedly help the average ham format a radiogram or other message type. It only uses the G. It's still not correct.
- Include BT between the addressee section (preamble) and the text, and likewise, between the text and the signature, to emphasize the unity of each individual radiogram (no blank lines).

The real secret of why the NTS relay methods work, it seems to me, is that every operator along the way expects a certain pattern and usage. If they don't hear or see (in the case of digital) that pattern, they will be asking for clarification ("fills"), taking valuable net time and providing an opportunity for mistakes to be introduced.

I am guessing that these formatting problems are exposing what is, at root, a training issue. Are we STMs giving our traffic handlers enough training opportunities? Are we accepting poorly formatted traffic without feedback (in person or by email, not on the net!)? Do our traffic handlers feel that they know the format and process, and can execute it with confidence? Do they feel they can speak up if they do not?

The NTS MPG is ideal bedtime reading, in the sense that it will put you right to sleep, but it is extremely useful, if you use it. It covers just about every case possible. Chapter 2, "Message Format," is very short, so not very painful. If that doesn't provide the answer, let me suggest that any traffic op with a format or procedure question take a minute to email their STM and ask. Someday you may really need to know!

I will step down from the soap box now and share with you some very interesting radiograms that I have received over the years …

```
73 R ##### ARL7 FEDERAL WAY WA NOV 24
LAURA K HUTTON K6HTN
PO BOX 60212
PASADENA CA 91116
BT
ARL SIXTY SEVEN GETTING
NO ANSWER
BT
#### #####
```

This message has perfect format, but, well, to which of many

messages of mine is it referring? How about this one:

```
SVC 9612 HXG ##### ARL 10 PHOENIX AZ SEP 19
PAT WB5NKD
PASADENA CA
BT
ARL SIXTY SEVEN 852 NOT
DELIVERED PHONE RINGS BUSY
73
BT
#### #####
```

All bulk traffickers must look alike, or be the same person in disguise (Pat is in OKC; Kate is in Pasadena CA)? The next one reminds me somewhat of free verse poetry:

```
SVC 15 R  HXG   #####  ARL 6   Phoenix Az. July 15
                  Kate K6HTN
ARL sixty seven 3937 no answer
                #### #####
```

I'm sure this guy knows better:

```
126 R ##### 9 SALT LAKE CITY UT JUL 4
KATE HUTTON K6HTN
PO BOX 60212
PASADENA CA 91116
BT
MSG'S 3706 3707 3708 DEL'D
JULY 4 X 73
BT
#### #####
AR
```

Sometimes NTSD just lops off the last line. This is why I always put AR on my traffic that goes that way, as no-one will miss that if it's eaten.

```
46 R SVC K0VTT 5 OELWEIN IA 24 JUN
KATE HUTTON K6HTN
PO BOX 60212
PASADENA CA 91116
NO PHONE AVAILABLE
BT
YOUR 3462 DELIVERED BY PHONE
BT
```

Thanks, all! Continue to have fun passing traffic, but try to do it without messing too much with the message format.

Breaking News: NTS and FEMA
by James Wades, WB8SIW

On May 28, 2015, The Deputy Director of Disaster and Emergency Communications for the Federal Emergency Management Agency (FEMA) contacted Joe Ames (W3JY), Chairman of the NTS Eastern Area Staff and Section Manager of Eastern Pennsylvania, to inquire about the possibility of developing a relationship between FEMA and NTS. FEMA employees had already worked with Mr. Ames in his capacity as Section Manager for Eastern Pennsylvania and were therefore aware of his position as Eastern Area NTS Staff Chairman.

FEMA was looking for a high frequency messaging layer that could play a supplemental role in a "grid down" scenario. NTS was viewed as a possible supplemental resource, and NTS was identified as offering several advantages including:

- A unified, national management structure and supervision.

- Survivability in the form of decentralization, combined with independence from distributed infrastructure (HF radio is viewed as "the weapon of choice")

- Standardized procedures, including the radiogram format with its improved accountability data and network management tools offered significant advantages.

- Universal standards are defined by detailed "Methods and Practices Guidelines" (MPGs).

Recent experience had revealed that a lack of consistency amongst ARES groups has created a problem at the national level. This is not a condemnation of ARES, but rather a realistic assessment based on measureable data, which confirms the fact that ARES has, in recent years, evolved to focus almost entirely on local requirements. ARES is, of course, an excellent program, but most emergencies are local in nature and most such emergencies require tactical communications. Therefore, it is natural that ARES focus would evolve to a more local approach.

Lulled into complacency by such modern developments as the Internet and cellular data networks, many ARES groups have severed their relationship with NTS, believing no one wanted such a service. Instead of supporting and enhancing NTS, a few ARES groups have even gone so far as to discourage their members from active participation. The result is that ARES is now simply incapable of providing consistent connectivity beyond the local or section level.

Another widespread problem identified with ARES has been a widespread misunderstanding of the "ICS-213" message format and its applications. Some ARES groups believe that ICS-213 must be applied to ALL record message traffic functions, when,

by Federal standards, it is required only within very specific functions within the EOC and ICS (NIMS) process. The result of this is dissatisfaction with inconsistent and often non-existent access to a national messaging layer, and overall poor quality control at the local level.

In response to the inquiry from FEMA, NTS Area Staff representatives participated in two extensive conference calls, explaining NTS, its management philosophy, mission and purpose. This included the presentation of an executive summary paper covering these same topics, and also a possible framework for support. FEMA was particularly impressed with the modernized digital NTS program and the survivable interoperability options afforded by multiple network layers, which facilitate interoperable message flow to the "last mile" via commonly available (and survivable) modes such as voice and CW networks. The ability to inject record message traffic directly into NTS via the NTSD digital relay station (DRS) process using automated PACTOR technology was particularly appealing, allowing radio amateurs associated with FEMA to use existing government communications facilities to also access NTSD.

The radiogram format, with its additional network management tools and service capabilities, its universal date-time group and similar features are ideal for record message traffic, which must move between multiple time zones and propagate through multiple network layers to reach a dispersed unit within a disaster area.

FEMA is excited about developing a working relationship with NTS starting with the inclusion of NTS in an upcoming Federal Exercise. Of course, NTS Staff was very excited about the opportunity to assist, seeing this as an opportunity to reinvigorate NTS with a meaningful mission. After two conference calls, which occurred on June 8 and again on July 7, Mr. Ames transmitted a letter memorializing the results of these conversations to FEMA on July 10.

Although the ARRL-FEMA memorandum of agreement requires Newington's review of the pertinent details, a process ongoing as we go to press, NTS is already taking steps to prepare for a working relationship with FEMA. Building on the success of the modernized NTSD program and the hard work of our core volunteers who have done much to improve message quality and training throughout the United States; the Area Chairs are planning an expansion of the NTS program. This includes:

NCERT Program:

NTS has already started developing standards for the creation of "NTS Communications Emergency Response Teams (NCERT)." The NCERT process is not designed to compete with ARES. Rather, NCERTs will consist of a volunteer team of NTS specialists capable of deploying survivable messaging services within a disaster area. They will also be qualified to

support a Regional FEMA office or EOC that is already equipped with the necessary communications equipment. Each NCERT will be fully equipped, and its members trained and vetted, to establish communications using modes such as:

- Radio e-mail service

- Digital NTS (NTSD) messaging using high frequency PACTOR

- High Frequency SSB

- High Frequency CW

- VHF and UHF FM

- Additional modes based on Section and local requirements.

The NCERT program will be developed at the Section level. A minimum of one team per section will be the goal, with each section at liberty to develop additional teams. Each team will be a joint project between the Section Traffic Manager and NTS Area Staff, who will be responsible for chartering the local NCERT team once it meets the minimum standards. Specific training materials and guidelines will be pre-packaged to support the NCERT volunteers, who will be selected by the STM based on a proven track record of excellent operating skills and personal reliability.

NCERT volunteers will be cross-trained to ensure that all functions, CW, voice and data are staffed at least three-deep to facilitate continuous operation and to account for the possible absence of a volunteer. NCERT resources will be deployed based on priority, with FEMA support receiving primary service, state EMA support (through ARES) receiving secondary priority, and local EMA functions (through ARES) receiving tertiary priority.

Expansion of the DRS Program:

In the enhanced nationwide NTS messaging layer, manual mode nets will be of much greater importance. They provide a convenient, basic level of connectivity, which can prove of great advantage in time of disaster. The ability to embed one or more ARES/NTS volunteers equipped with a basic portable radio or manpack unit with a team deployed to a disaster area will be of importance. This may be the first step in the process of establishing communications in the event of a major incident until which time a full NCERT and other ARES/NTS teams can be fully deployed.

Once the NCERT is activated, the DRS function will be critical. The new digital NTS program provides the advantages of automation and error-checking, making it ideal for record-message traffic functions. Traffic propagates quickly through NTSD, but the DRS function is essential to providing a gateway either directly to an agency or via manual mode NTS networks. Therefore, one of the goals of the NTS Area Digital Coordinators is to expand the number of DRS appointments throughout the United States. In particular, NTS would like to see local ARES organizations deploy the necessary High Frequency PACTOR facilities and assign one or more volunteers to be qualified as a DRS for direct interface to NTSD.

ICS-213 Management:

The Programs and Services Committee has tasked NTS to develop standardized protocols to facilitate the transfer of messages in ICS-213 format (see back issues of "QNI" for more information on ICS-213/radiogram compatibility). This fits nicely into the FEMA initiative. Local and state agencies will undoubtedly submit messages on standardized ICS-213 forms. Depending on the communications circuit utilized, such messages may either be conveyed intact, converted to radiogram format, or wrapped in a radiogram "wrapper" to ensure that the message propagates through the NTS system with the necessary network management tools intact.

A work plan has been submitted to the Programs and Services Committee and NTS Area Staff is now working on the development the necessary standards and procedures, which will define the management procedures for ICS-213.

Messaging Drills and Exercises:

In anticipation of an enhanced nationwide messaging system, NTS will begin implementing a series of emergency drills and exercises. These will be used to test the system, identify areas needing improvement and better prepare our volunteer base for an important disaster response mission. Such exercises will be targeted in nature and will be designed to exercise not just manual mode nets, but NTSD and the DRS function.

Participation in major national exercises is also anticipated. These will be supplemented by internal NTS exercises, which might be described as "drills," including occasional field deployment exercises and an enhanced ARRL Simulated Emergency Test commencing in 2016.

NTS Area Staff is anticipating the appointment of a "National Emergency Communications Coordinator" who will be responsible for exercising and preparing the national messaging layer for instantaneous service in the event of a "grid-down" scenario.

Improved Training and Liaison:

The development of an enhanced NTS nationwide messaging layer will require improved cooperation between ARES and NTS. The message has now been received "loud and clear." Those who have argued that a nationwide messaging layer is unnecessary have been proven incorrect. Likewise, those who

have argued that the radiogram format, with its essential network management tools is obsolete have been proven incorrect. Fortunately, the vast majority of ARES and NTS members are dedicated, hard-working individuals who believe in mission success and therefore recognize the value of these programs and procedures.

NTS Area staff and its supporters on the ARRL Board of Directors have every confidence that Amateur Radio will step up to the plate to support these initiatives in a very positive, proactive manner that is in keeping with our history of technical innovation and public service. In the future, ARES and NTS volunteers should anticipate:

- The development of a new "NTS Manual" to serve as a parallel document to the new "ARES Manual."

- The development of a standardized, system-wide power-point presentation for NTS training covering basic net theory, structure and procedures.

- The incorporation into the MPG of official procedures for managing, converting and wrapping ICS-213 messages for transfer via NTS circuits.

- The development and release of standard operating guidelines for NTS Communications Emergency Response Teams (NCERTs).

- Improved coverage and promotion of the "all-RF" digital NTS system so that ARES and NTS members and other leadership officials fully understand the structure and capabilities of the system.

- Implementation of a cycle of drills and exercises designed to test and enhance the nationwide messaging layer.

Summary:

NTS Area Staff is currently working with our supporters on the ARRL Board of Directors to bring these initiatives together in a very positive and constructive way. It is anticipated that these initiatives will do much to engender an atmosphere of positive cooperation and cross-fertilization between the ARES and NTS environment, which will reap great benefits for both groups.

More details on these initiatives will be forthcoming as they develop. In the meantime, NTS and ARES members are encouraged to spread the exciting news that Amateur Radio has been tapped for yet another *important* mission, which will emphasize *real* technical and operating skills and which will likely serve as motivation for many operators to return to NTS and for potential radio amateurs to find the motivation needed to become licensed and join the Amateur Radio Service as a way to use their computer, technical and communications skills to better serve their nation and community.

Whether one's interest is phone, CW or computers and digital modes, there is now a place for you in today's modern, National Traffic System and the Amateur Radio Emergency Service. Why not join us and be part of a winning team?

Let's promote this positive development and look toward a future of close cooperation between not just ARES and NTS, but between the public service interest sector and other operating interests such as contesting, experimentation and digital interests.

A bright future awaits us!

-30-

Operating Tip— "QSD"
by James Wades, WB8SIW

The Q-Signal "QSD" is rarely encountered, but it is nonetheless quite useful at times.

QSD translates as: "Your signals are mutilated" or "Your keying is defective," depending upon the source reference material one utilizes. Essentially, it's a quick and efficient way to inform another operator that he has a keying problem.

Modern, solid state transceivers are often quite susceptible to keying problems. RF on the keying line, dirty key contacts and similar faults can cause distorted CW signals, which may not be noticeable to the transmitting operator.

By transmitting "QSD," one can quickly inform an operator of keying problems without a lengthy explanation. This is particularly valuable on radiotelegraph nets where time is of the essence.

Some will argue that less common "Q-Signals" should not be used. However, every radiotelegraph operator should have a list of Q-signals. Likewise, the majority of today's active radio amateurs have access to the Internet. For example, a "Google" search of "QSD Q-Signal" turned up over 9000 results!

ARRL Form FSD-218 has a convenient list of the special QMN/ARRL NTS "QN-Signals" for radiotelegraph net use, as well as a listing of the more common Q-Signals that are best suited to the Amateur Radio Service. This document also contains a summary of the radiogram format and its components. One can find this document at:

http://www.arrl.org/files/file/Public%20Service/fsd218.pdf

-30-

Some years ago, the author suggested that Amateur Radio should not neglect the development of High Frequency networks, arguing that they are one of our most survivable resources.

The response from some in the ARES community was surprising to say the least. One Emergency Coordinator from Florida responded by suggesting that the author was "a clueless moron." and another spoke of how he was "laughing out loud" at the suggestion. Yet another deferred to his emergency management director, undoubtedly an expert on emergency communications network management, who "was never so happy as to get rid of those noisy HF radios in his EOC."

Of course, these are the most egregious examples, and they are not typical of the rank and file ARES member; however, they do exemplify the trend toward an entirely local focus that has become all to common in the Amateur Radio Emergency Service.

Rather than advancing the argument again, I challenge my fellow radio amateurs to read these two press releases. Ask yourself, whether government and business would be investing in survivable HF messaging if they didn't believe such backup systems are necessary. Then ask yourself this important question:

"Should I support NTS and its modernization and revitalization efforts?"

I don't recall the name of the EC in Florida who referred to me as a "clueless moron," but if he's still around, I want him to know I am in good company.

Rockwell Collins announces plans to offer nationwide disaster communications system via HF radio

Aug 18, 2015 **Donny Jackson | *Urgent Communications***

WASHINGTON, D.C.—Rockwell Collins yesterday announced plans for ARINC UrgentLink, a nationwide high-frequency (HF) radio network that is designed to provide communications between public-safety and critical-infrastructure entities when local terrestrial networks have been destroyed by a man-made or natural disaster.

UrgentLink utilizes spectrum allocated for maritime use, but it can be used on land during times of disaster, when normal communication infrastructure is inoperable, according to Dave Chapman, product manager for RockwellCollins.

"We believe it's the first purpose-built network for disaster response with nationwide coverage," Chapman said. "We've developed a system and a network that allows people to communicate using HF radios instead of traditional land mobile radios in disasters like this—and we made it easy."

Because of the propagation characteristics of the spectrum, HF radio has long been used as a method to communicate across vast distances, but it traditionally was the domain of amateur-radio operators licensed by the FCC. By using automatic link establishment (ALE) technology, the Rockwell Collins system lets HF radio can be used by anyone, Chapman said.

"[With ALE], the radios are constantly talking to each other to determine the optimal frequency to use the next time the next time they place the call," he said. "Instead of the traditional way that ham radio uses, it's kind of one-touch calling, so that anybody can use it—it doesn't take a specialization or an FCC license to do so.

"That allows emergency managers, police officers, hospital administrators or anybody to reach outside a disaster zone and report what they need—after-response help and things like that—as well as talk to peers and other customers who use this service within the disaster zone."

Rockwell Collins currently has a pilot HF network with a large sheriff's department and is in discussions to deploy other pilot systems, Chapman said. The company plans to offer commercial HF service within a year that will not require customer maintenance, he said.

"We're going to run this as a service, similar to having a cell phone," Chapman said. "We will supply them with a radio that will work on the UrgentLink network, then Rockwell Collins will go out and do the install and manage it."

"[Customers will] pay a monthly or yearly subscription fee that gives you access to the network and the services that come with it."

HF 9-1-1T provides backup communications system that works when everything else fails

LONGMONT, Colo., December 19, 2012 -

Intrado Inc., a subsidiary of West Corporation and a leading provider of 9-1-1 technology solutions, has secured an exclusive agreement with ShipCom, LLC, the only High Frequency (HF) civilian maritime radio network operator in America authorized by the Federal Communications Commission (FCC) to provide emergency communications on land when existing communications infrastructure is inoperable.

Intrado plans to offer a new backup emergency HF radio solution to support public safety, hospitals, nuclear power plants, utilities, transportation and other critical infrastructure providers. For the first time these organizations will have access to highly reliable HF radio spectrum, previously reserved for maritime operations.

In 2005, Hurricane Katrina crippled the Gulf region's primary communications system infrastructure. ShipCom's Maritime HF frequencies were utilized by the Coast Guard to communicate on land during its Katrina-related operations, and were the primary method of communications in the rescue of over 33,000 people. As a result, in 2010 the FCC granted ShipCom a Waiver to operate their HF maritime network frequencies on land during emergencies when a man made or natural disaster renders existing communication infrastructure (wireless, wireline, and satellite) inoperable.

George Heinrichs, cofounder and president of Intrado, remarked, "For more than 30 years, Intrado has maintained a focus and passion for saving lives via our 9-1-1 systems, services and technology. The ability for Intrado to offer a communications system that works when everything else fails is an important addition to our capabilities. We plan on making an emergency HF backup communication option available to 9-1-1 dispatch and emergency operations centers, hospitals, first responders, providers of critical infrastructure, and federal, state and local agencies."

Beyond maritime use, HF is currently used by the Federal Aviation Administration (FAA), the Centers for Disease Control (CDC), the Federal Emergency Management Agency (FEMA) and other Federal agencies. The President on Air Force One and soldiers in battle rely on HF as a trusted form of communication when other systems fail.

Stephen Meer, cofounder and chief technology officer of Intrado, has been instrumental in advancing the nation's 9-1-1 network. Mr. Meer said, "This is one of the most exciting developments I've seen in public safety emergency communications, and I'm proud that Intrado will play a major part."

Meer also noted that, "Hospitals in America rely on the hard work, patriotism and volunteerism of HAM Radio operators to be their emergency communications system. This new network will greatly expand the capabilities available to HAMs during these times of crisis, and will back up their efforts with an immediately available, sophisticated HF radio network interoperable with the E-9-1-1 infrastructure. Hospitals and other critical agencies will have seamless, reliable, encrypted and redundant HF radio capability, giving them immediate connectivity to the outside world in the event of a disaster that renders their other communications systems unuseable." As planned, the new Intrado HF 9-1-1T service will begin deployment in the next 90 - 120 days, starting with public safety, hospitals, nuclear reactors and other critical infrastructure.

About Intrado In business for more than 30 years, Intrado, a subsidiary of West Corporation, has maintained a focus and passion for saving lives and supporting the needs of public safety. Agencies and telecommunication services providers throughout the world depend on Intrado for emergency communication services and technology. Intrado's dedicated focus on emergency communications technology allows the company to continue pioneering network innovations that improve emergency response. For more information, visit www.intrado.com.

Are you ready to step-up?

- **Do you** *really know how to use the phonetic alphabet to spell difficult names, phrases and technical content?*

- *Do you really know how to keep an organized radio log, copy message traffic efficiently and track/retain copies of important messages?*

- *Can you maintain a directed net that is efficient, even under stress and heavy traffic load?*

- *Do you understand how digital NTS works? Have you ever taken the time to examine how many routine messages NTSD handles per month? Are you familiar with its many commercial-grade features?*

- *Is your ARES group equipped for advanced PACTOR modes to facilitate automated digital networks such as NTSD and radio e-mail services?*

- *Are you confusing the* <u>content</u> *of routine NTS messages with the* <u>importance</u> *of developing and exercising a survivable, fully functioning national network?*

REMEMBER! It is the maintenance of the network along with its associated training and exercising value that is important. Whether one originates or delivers a birthday message or a priority message supporting a government agency, the same technology, techniques and methods apply.

Without practice and without training, one is not a radio operator. Without the proper equipment, one is not prepared for emergency.

Without liaison to both the manual modes and digital NTS, either directly or indirectly, an ARES organization is isolated from the national messaging layer. It is also incapable of effectively serving important Federal and state agencies. **LET'S GET BUSY REBUILDING ARES AND NTS!**

*An Independent
NTS Newsletter*

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

RECEIVING LUNCH BY RADIO
50 YEARS HENCE
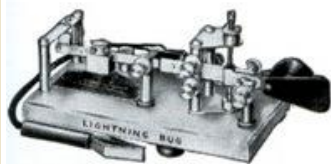
TECHNOLOGY AS A MEASURE OF PROGRESS

In 1922, the illustrator Howard Brown prepared this artist's conception of radio in the future for Hugo Gernsback's "Radio News" Magazine. Looking back, we all know that the 1970s failed to bring us "food by wireless," but the decade did bring us the CB radio fad. Perhaps the dream for radio was overrated.

Brown's illustration was likely in jest, but like much of our humor, it also contained a message. Many new technologies generate their share of dreamers who believe the latest innovation is a "game changer," with almost miraculous powers to change mankind. Yet, history teaches us that reality often falls short of expectations.

Undoubtedly, many today, believe the Internet and mobile data networks will make us happy and transform the World for the better. Yet, history may ultimately disagree.

Ultimately, technology doesn't change human nature. It may alter our behavior, but the basic human flaws that degrade mankind remain.

One might even argue that technology has amplified the arrogance of modern man. We now measure the progress of society primarily our capacity to develop new technology. We overlook classical measures of cultural progress such as social justice, tolerance, economic opportunity, philosophical and spiritual development, human rights and progress in the pure and natural sciences and the arts.

What would happen if the trillions invested in mobile technology was instead invested in medical research? What would happen if the trillions of dollars spent each year to access entertainment media was instead invested in education and an effective war on poverty? What if the countless hours individuals spend consuming prurient entertainment was instead invested in thoughtful pursuits?

Is the belief that the Internet will change the World as far fetched as Howard Brown's illustration? Think about it.

73, James Wades, Editor, "QNI."