



PRIORITY TRAFFIC

Newsletter of the DELAWARE COUNTY Amateur Radio Emergency Service



Vol. 2, No. 2

“ Service - Commitment - Readiness “

1st Quarter 2007

NEW LAW ADDS AMATEUR RADIO TO PART OF EMCOM COMMUNITY

A section of the Department of Homeland Security 2007 Appropriations Act, HR 5441, formally includes Amateur Radio operators as a part of the emergency communications community. The bill was signed into law by President Bush on October 4.

Amateur Radio is included within the legislation’s Subtitle D, Section 671, known as the “21st Century Emergency Communications Act.” Radio amateurs are among the entities with which a Regional Emergency Communications Coordination Working Group must coordinate its activities.

RECC Working Groups will assess the survivability, sustainability and interoperability of local communications systems to meet the goals of the National Emergency Communications Report. That report would recommend how the United States could “accelerate the deployment of interoperable emergency communications nationwide.”

FCC AMENDS PART 97 TO PERMIT AMATEUR AID TO RELIEF ACTION

The FCC has changed the rules in Part 97 from limiting amateur communications in support of relief actions in disaster situations when normal communications were overloaded, damaged or disrupted, to allowing amateurs at all times and on all frequencies authorized to the control operator to meet essential communications need and facilitate relief actions. This relaxation of the rules should eliminate questions and confusion that have historically put up hurdles to using Amateur Radio in emergencies. In its Report and Order, the FCC also acknowledged one of the key purposes of Amateur Radio is to provide emergency communications to the public.



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DELAWARE COUNTY EMERGENCY COMMUNICATION TEST A SUCCESS

Delaware County’s participation in the Section Emergency Test on Saturday, October 7 proved to be a valuable and successful trial of emergency communication capability and readiness.

The SET was held by many ARES / RACES units throughout the First District of the EPA section and brought emergency communications teams into the field to set up portable radio stations and pass simulated emergency traffic to county EOCs.

A response team from DC ARES led by Bob Wilson, W3BIG, and Joe Ames, W3JY, set up two portable HF / VHF / UHF stations in Ridley Creek State Park operated on battery power. One station even used four solar panels to recharge it’s battery. The field installation included a 32 foot vertical and G5RV antenna in NVIS configuration.

During the exercise, the Delaware County unit established contact on HF with other emergency stations in Bucks, Chester and Montgomery Counties and passed message traffic originated by First District DEC Bob Famiglio, K3RF. A total of nine amateurs helped make the exercise a success including N3ZAV-Bill, N3YXQ-Charles, W4RFJ-Roger, KB3FPM-John, N3IXQ-Dan, W3EMA-Bill, K3RF-Bob, W3JY-Joe and W3BIG-Bob.



Joe Ames, W3JY connects solar panels during SET.

A MESSAGE FROM OUR LEADER

DAN McMONIGLE, N3IXQ

Emergency Coordinator, Delaware County

Happy New Year fellow Delaware County ARES/ RACES members and friends!

I want to start by saying "Thank You" to Joe Rzucidlo, K3CGA, for his long tenure as EC and for the mentoring time he has bestowed on me. His steady hand has been important to the folks of the ARES/ RACES family.

So, who the heck am I? Most of you know me. But for those who do not, I am a lifelong resident of Delaware County. Except for a few years in the US Coast Guard in the 1970s, I have always lived in Delaware County. My mother still lives in the same house in Lawrence Park, Broomall, that I was raised in. I now live in Newtown Square with my wife of 23 years, Nancy, and my four sons (none of which are HAMS). I have lived in Ridley Park, Springfield, Drexel Hill and Linwood at one time or another. While in Linwood, I served as an elected township commissioner for many years. I work for Comcast Cable in Oaks, near Valley Forge.

I have many hobbies, HAM radio being one of my favorites. I also play guitar and sing, having been in and out of various rock bands along the way. I also enjoy riding motorcycles, so it shouldn't surprise you to know I am also a member of the Tri-state Harley Owners Group out of Media.

Back in the HAM radio world, I am a certified EmCom Trainer and hold the Level 3 Advanced EmCom certificate. I also have various certificates in emergency communications from FEMA, PEMA and Homeland Security.

I will use this forum in future publications to keep you up on what's going on in the organization and what educational availabilities exist through your membership. It will be my intention to grow the membership and build a well-trained, certified group of Emergency Communicators, all while having great fun and building lifelong friendships. We already have a great nucleus of members, but we can always use more.

I am always available to talk, or email. My email address is n3ixq@delcoares.org. My home phone number is 610-356-2254.

Dan McMonigle, N3IXQ

EmCom Words of Wisdom

As hams, we use a great deal of "jargon" (technical slang) and specialized terminology in our daily conversations. Most of us understand each other when we do and if we do not on occasion it usually makes little difference. In an emergency, however, the results can be much different. A misunderstood message could cost someone's life. For these reasons, ALL MESSAGES AND COMMUNICATIONS DURING AN EMERGENCY SHOULD BE IN PLAIN LANGUAGE.

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Is the official newsletter of the Delaware County ARES / RACES Organization. Please direct all inquiries, article submissions or other correspondence to:

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UPCOMING EVENTS / ACTIVITIES

- FEB 17** Dog Sled Race - Sullivan County
- FEB 18** Quarterly Meeting at EOC, 7:00 p.m.
- MAR 15** PEMA Severe Weather Drill
- APR 22** MS Walk - Ridley Creek State Park
- APR 29** WalkAmerica - Ridley Creek State Park

For more information, check our website:

www.delcoares.org

News articles and features published in this newsletter are from many sources, including QST and CQ magazines, and will be attributed where space permits. We apologize for any omission.

ARES / RACES NET

1930 Hours every Wednesday

147.195 Repeater PL 100.0

442.250 Repeater PL 131.8

447.375 Repeater PL 100.0



NVIS COMMUNICATION TECHNIQUES ADOPTED BY EMCOM OPERATORS

As Amateur Radio emergency communication units scramble to attain interoperability with regional EOCs, there has been a renewed interest in NVIS techniques.

Near-Vertical-Incidence-Skywave is a radio technique first employed by German ground forces during WW2 and then refined by U.S. Army units in Vietnam. It was discovered that mobile and field radio units could more successfully communicate with base stations if they deployed their HF whip antennas in a horizontal configuration low to the ground.

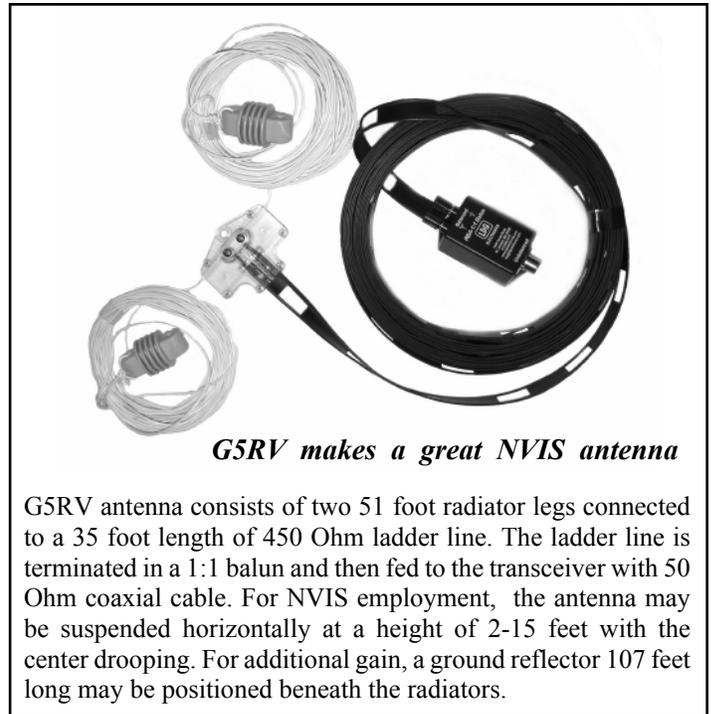
Stations using an NVIS strategy transmit signals at a very high angle of radiation, reducing ground scatter and virtually eliminating the dead skip zone so prevalent among close stations attempting to communicate on the HF bands. To be effective, all stations on an NVIS network should use similar antennas with a horizontal polarization relatively low to the ground.

The reason NVIS has become so important in EMCOM, is that in disasters and other emergencies with attendant power outages, Amateur Radio repeaters are prone to the same disruptions that knock out police and fire communications. Without repeaters, VHF and UHF communications are only as effective as the limited line-of-sight capability of simplex signals. To communicate effectively with adjacent counties and regional EOCs may require HF stations to use the 40, 60 and 75 meter bands.

When using typically configured HF antennas at heights of at least $\frac{1}{4}$ wavelength, radiation angles are usually low and signals skip off the F2 layer of the ionosphere at obtuse angles, leaving a dead skip zone close-by which degrades local and regional communications considerably. That is why you often hear a close-by station so poorly.

When using a low-slung dipole, inverted-vee or G5RV antenna mounted 2-15 feet off the ground, a station can transmit a signal which reflects off the F2 layer at an acute angle, resulting in an effective cone of radiation that is often 200 to 300 miles in diameter. An additional benefit to high-angle NVIS communication is the reduction in atmospheric noise which can seriously degrade reception performance.

During the October 7 Section Emergency Test, a Delaware County ARES / RACES team successfully deployed an NVIS antenna at a height of five feet from Ridley Creek State Park. The system worked quite well and communication was established on the 75 meter band with EOCs in Bucks, Chester and Montgomery Counties. During the recent PA QSO Party, the same antenna was employed from the same location and using only 30 watts, contacts were made on 75 meters with excellent signal reports in 17 Pennsylvania counties in every section of the state.



G5RV makes a great NVIS antenna

G5RV antenna consists of two 51 foot radiator legs connected to a 35 foot length of 450 Ohm ladder line. The ladder line is terminated in a 1:1 balun and then fed to the transceiver with 50 Ohm coaxial cable. For NVIS employment, the antenna may be suspended horizontally at a height of 2-15 feet with the center drooping. For additional gain, a ground reflector 107 feet long may be positioned beneath the radiators.

DELCO ARES PEOPLE IN THE NEWS

The following Delaware County ARES / RACES personnel have been newsworthy by virtue of their training achievements or appointment to ARRL positions.

N3IXQ - Dan McMonigle has been appointed EC by SM Eric Olena, WB3FPL, effective February 7. Dan's prior experience as AEC for Operations and his enthusiastic leadership will be a great asset to our team. Congratulations, Dan.

W4RFJ - Roger Jordan has been appointed Assistant District Emergency Coordinator by Bob Famiglio, K3RF to assist Bob with his duties. Roger's digital expertise will be an invaluable asset to emergency communications in the district. W4RFJ was also recently appointed by Section Manager Eric Olena, WB3FPL, as an OES, Official Emergency Station and TS, Technical Specialist

N3OFR - Fred Field has earned his AREC Level III certification and has now passed all three levels. Fred's accomplishment was recognized in a recent edition of *QST* magazine.

W3BIG - Bob Wilson was recently appointed Assistant Emergency Coordinator for Operations for Delaware County ARES / RACES and also appointed an OES, Official Emergency Station by Section Manager Eric Olena, WB3FPL.

W3EMA - Bill Wilson was appointed PIO, Public Information Officer, by Section Manager Eric Olena, WB3FPL. Bill's considerable experience as a magazine editor as well as public relations director will help promote the accomplishments of all Amateur Radio operators within the First District.

EMERGENCY BATTERY POWER - OPTIONS, ALTERNATIVES AND FACTS

In most emergency scenarios where Amateur Radio is called upon to provide critical communication services, commercial power is usually unavailable. Many ARES / RACES units have access to portable, gasoline-powered generators, but often in the initial response period, the first communication teams to arrive on scene rely on battery power.

Because hand-held transceivers (Hts) usually don't have RF power levels necessary to maintain consistent communication networks, their utility during sustained periods of need often fall short. Though Hts are equipped with excellent NiCd, NiMH or LiIon battery packs, the focus of this article will be to provide an overview of the options available for powering portable or mobile HF / VHF / UHF transceivers with power levels from 10 to 100 watts.

GET THE LEAD OUT

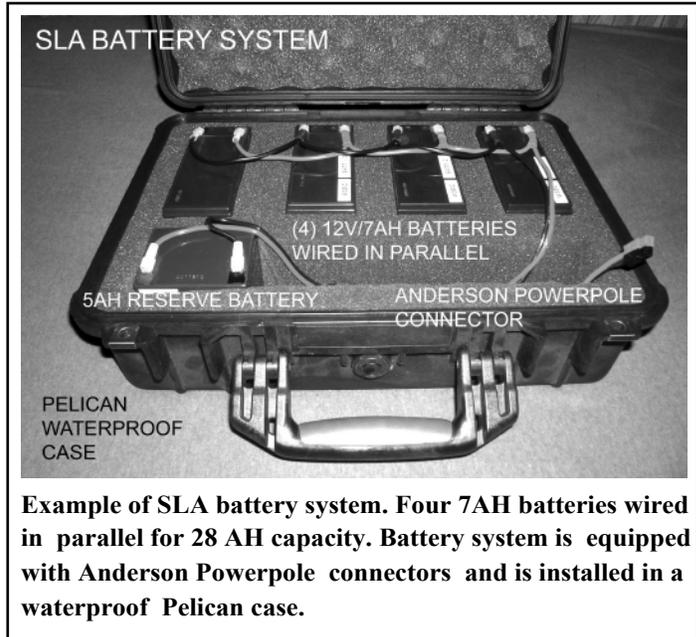
Lead acid batteries have become the preferred choice for powering radio equipment for prolonged periods. Though heavy, lead acid batteries have the capacity to provide power from a few hours to several days, depending on size and duty cycle. There are three major types of lead acid batteries and to make a decision on which type is right for you, we will look at the characteristics, as well as pros and cons of all three types.

TYPES OF LEAD ACID BATTERIES

FLOODED or WET lead acid batteries are those commonly used in automotive systems. They have a liquid electrolyte. Automotive batteries are not generally a good choice for radio use because they are not designed to provide power for prolonged periods. They can be damaged if operating voltage drops below 80% of their rated voltage. Wet lead acid batteries designed for RV use or in uninterruptible power supplies (UPS) are a good choice, as are deep-cycle marine batteries. Advantages of flooded or wet lead acid batteries are large storage capacities, often in the 50 to 200 AH range. Disadvantages are heavy weight and the damage resulting from spilling or tipping the battery. These big boys must be kept upright or damage could result.

VALVE REGULATED LEAD ACID (VRLA) batteries contain a gelled electrolyte or absorbed glass matt (AGM) technology that can't spill. They are available in capacities from about 5 AH to nearly 100 AH. These batteries are a little lighter in weight than wet lead acid batteries, but they must also be kept upright.

SEALED LEAD ACID (SLA) batteries also use a gelled electrolyte, but they are sealed units that can be operated in any position - even upside-down. They are available in capacities ranging from 2 AH to 100 AH and are commonly available.



Example of SLA battery system. Four 7AH batteries wired in parallel for 28 AH capacity. Battery system is equipped with Anderson Powerpole connectors and is installed in a waterproof Pelican case.

OTHER ALTERNATIVES

Ready-made portable battery systems are available from a variety of manufacturers, including PowerPort, which makes several models for Amateur Radio use. These systems include chargers and multiple outlets for cigarette lighter adapters.

Another really good source for portable, heavy-duty battery systems are those designed as auto battery boosters. They come equipped with internal sealed lead acid batteries with capacities in the 18-25 AH range and include chargers. Almost all are equipped with cigarette lighter outlets. These units are rugged, portable and are in the \$50 - \$120 price range. Pep Boys sells the Coleman Powermate unit enclosed in a durable lexan case that includes a small work light at a cost of \$50.

BATTERY POWER BUDGETING

Emergency radio operators must be aware of the current consumption of their equipment on both receive and transmit to estimate how long their battery system will sustain operations. A rough estimate of run time can be gauged by adding the current consumption on receive (typically 1 Amp) to that of the transmit consumption divided by the duty cycle. A typical VHF/UHF transceiver operated at 10 Watts will draw 4 Amps. At a 25 percent duty cycle (15 minutes transmitting each hour), the transmit current (4 Amps) would be divided by 4, with a result of 1 Amp. Added to the 1 Amp receiver drain, total current consumption would be 2 Amps per hour. At this duty cycle, a 28AH battery would run the radio for approximately 14 hours.