



ARES COMMUNICATOR

Information for Scott County Amateurs



July, 2018

Accurate, Reliable Emergency Communications for our Community

Volume 18, Number 7

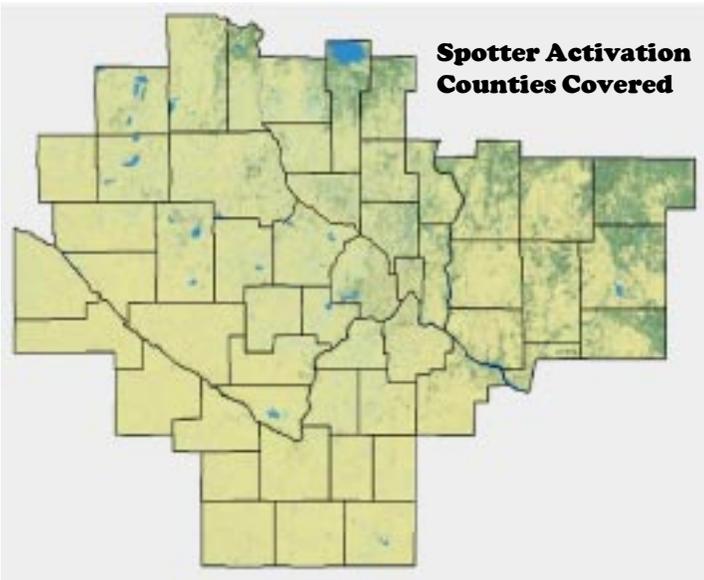
Spotter Activation Status

There is a very useful page on the 'net to assist spotters and Skywarn NECOS Operators in level of possible Skywarn activity.

Check out the information at: www.weather.gov/mpx/spotteractivation

This page is the National Weather Service Twin Cities - Local Spotter Activation Status. This is the site mentioned during this year's Skywarn Spotter training classes.

The info on the page will give you an idea of the likelihood of activation and the areas (counties) considered to be most at risk. Make this another tool in your spotting tool-belt.



BREAK - OVER

The ARES COMMUNICATOR is published for the benefit of Amateur Radio Operators in Scott County and other interested individuals.

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Contest University

The 2018 DAYTON Contest University videos and slides are now available. Tim, K3LR, reports, "Thanks to Icom America (Ray, N9JA), the Dayton Contest University Professors and Teri, K8MNJ (organizer and webmaster), the slides in PDF format from all 2018 presentations (and many past years) and several 2018 YouTube videos

are now available. Go to the Contest University Web site at: <http://contestuniversity.com>

Click on FILES for the PDF slides and click on VIDEOS for links to the available recorded sessions (thanks to KC1CWF). The Contest University is usually held the day before the Dayton Hamvention officially opens. It is billed as a rare opportunity to gain knowledge that may take years of practice, trial and error or lost time to learn otherwise. Get the edge to improve your scores and put your station in the winners circle today! "Hope to see you at Dayton CTU 2019!"

The site contains a wealth of information from experienced contest operators and is worth exploring. This may give you some insight to the question, "How did they do that?," when you are scanning any listing of contest results.

The info available is helpful to contesters and non-contesters alike.

BREAK - OVER

ARES Activities

Weekly Net Monday 7 PM 146.535 mhz (s)

Breakfast Saturday, August 11th

Digital Monday, August 13th

ARES Nets

MN ARES Phone Net

6:00PM Sunday Freq: 3.860 mhz

ARRL MN Phone Net

12:00p, 5:30p CST Daily Freq: 3.860 mhz

ARRL MN CW Net

6:30p, 9:50p CST Daily Freq: 3.568 mhz

NETS WITH OUR NEIGHBORS

North Dakota: Daily 3.937 mhz 6:30pm

South Dakota: Daily 3.860 mhz 6:00pm

Wisconsin: Daily 3.985 mhz 5:30pm

Iowa: Daily 3.970 mhz 12:30/5:30pm

New FEMA Training Ready

FEMA releases revised IS-2900.a course

FEMA's National Integration Center and the FEMA Emergency Management Institute are pleased to announce the release of a revised online course on 12 July:

IS-2900.a, National Disaster Recovery Framework (NDRF) Overview: The National Disaster Recovery Framework (NDRF) Overview course provides an introduction to the NDRF and establishes a common platform and forum for how the whole community builds, sustains, and coordinates delivery of recovery capabilities. The NDRF provides individuals supporting disaster recovery efforts with a foundation in National Disaster Recovery Framework (NDRF) key concepts, guiding principles, and roles and responsibilities of NDRF leadership, including those of individuals, households and governmental entities at the local, State, tribal, and Federal levels, and between public, private and nonprofit sectors.

The intended audience for this course is the members of the whole community who have a role in providing recovery support – individuals, local, State, tribal, territorial, insular area governments and non-governmental organizations.

The revised course is available through the EMI website <https://training.fema.gov/is/>. Students will still have access to tests for the legacy versions of this course (IS-2900) for 30 days.

An additional twenty-eight NIMS curriculum courses are in final revisions for NIMS 2017 and will be available as they are completed and approved for release.

BREAK - OVER

Test Your NIMS Knowledge

This month we begin our review of ICS-700, An Introduction to National Incident Management System. This course is designed to enable personnel to operate efficiently during an incident or event within the Incident Command System (ICS). ICS-700 provides an overview of the NIMS structure.

Check your recall of the course material with this question.

1. A basic premise of the NIMS and National Response Framework (NRF) is that:
 - A. Incidents should be managed at the lowest jurisdictional level possible.
 - B. Unity of effort and command results when responding jurisdictions and agencies are willing to relinquish their authorities.
 - C. Effective response relies on the readiness of response partners to self-dispatch to an incident scene.
 - D. Preparedness is inherently a government responsibility and does not require participation from nongovernmental organizations.

Check next month's ARES Communicator for the solution

June NIMS Knowledge Solution

1. Select the statement below that best describes one benefit of NIMS.
 - A. Establishment of standardized organizational structures that improve integration among jurisdictions and disciplines.



NBEMS Current Versions

The current version of the Fldigi manual is available at NBEMS Info page at www.scottares.org. Look under the 'Help Sheets' heading.

Now is a good time to check to your digital software to make sure you are running the newest versions. You can find the most recent versions posted at both: www.w1hkj.com/ and www.scottares.org/NBEMS.htm

Here are the most recent releases as of July 25, 2018.

Software	Version
Fldigi	4.0.17
Flwrap	1.3.4
Flmsg	4.0.6
Flamp	2.2.03

The Monday evening training net is a great place to have your digi questions answered and problems solved! Join the Scott ARES group on 146.535 MHz simplex at 7:00pm on Monday evenings.



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Oops Protection!

"The most expensive component on the board will sacrifice itself to save the fuse!"

We have all probably done it and some will even admit it. Connected the power supply with reversed polarity. Sooner or later you will realize your error a millisecond after you hit the switch. You could prevent the facepalm for less than a dollars worth of parts.

Oops prevention has two basic steps: 1. Fuse all power inputs to a project, 2. Blow the fuse if the polarity is reversed!

How to blow the fuse if the polarity is reversed uses a diode across the power input. The symbol for a diode provides the answer to connecting the diode.

Conventional current flow is defined as moving from positive (+) to negative (-). Current flows through a diode in the direction of the arrow in the diode symbol. From Anode to Cathode. Remember this is conventional current flow NOT electron flow. Confused? Just remember the diode conducts in the direction of the arrow. The actual diode has a band near one end. This band identifies the Cathode (-) end of the diode.

We want to connect the power supply positive to positive and negative to negative. We do not want the diode to conduct in this situation so we connect the Anode (+) end of the diode to the Negative power input and the Cathode (-) to the Positive power input.

The diode is reverse biased and does not conduct and has no effect on the circuit.

Now, just try and connect the power supply backwards! The diode will turn on and conduct shorting out your reverse connected power supply. This will blow the fuse you put in-line on the positive power input! You did remember to include a fuse in the circuit didn't you?

No fuse? Well, the diode will conduct until the heat of the short circuit creates some smoke and a popping noise as the diode self destructs and your project is toast due to a reversed power supply.

No, you cannot hit the switch in time to save the project! Sorry.

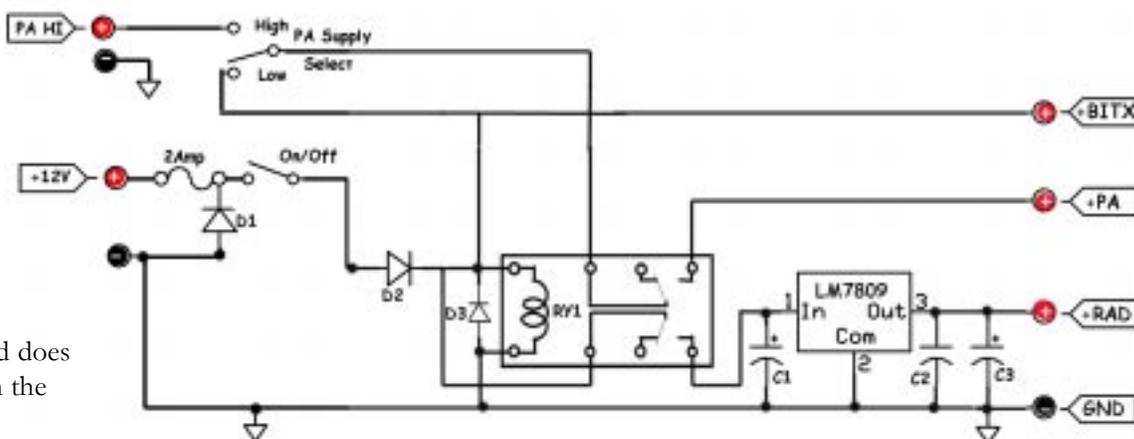
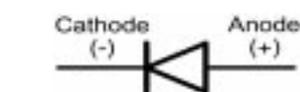
Another method of power input protection uses a diode and a relay to limit reverse polarity damage.

This scheme uses a relay with the coil in series with a diode that is forward biased in the normal power supply hook-up. When the polarity is correct, the relay is energized and power is supplied to the circuit (see schematic). You can usually find DPDT 12volt relays on the internet for about \$0.50 each. (www.ebay.com/itm/10Pcs-hk19f-dc12v-shg-dc-12v-coil-dpdt-8pin-pcb-realplay-power-relay-Pop/192332684324)

The schematic shows a circuit for protecting the BITX40 project from a reverse polarity blunder. The BITX40 has the option to run the final power amp at a higher voltage for higher output. That power supply line is also reverse polarity protected by using a DPDT relay. The price is right!

The remainder of the schematic provides for a 9 volt power input to the Arduino Nano in the Raduino portion of the BITX40. This little addition reduces the load on the Nano 5 volt regulator by operating on a 9 volt input instead of approximately 12 volts and provides better regulation for the Nano. Typical component values for schematic.

- | | | | |
|--------|--------------------|----|---------------|
| D1 | 1N5401 typ | C1 | 0.33ufd 50vdc |
| D2, D3 | 1N4001 | C2 | 0.1 ufd 50vdc |
| RY1 | DPDT 12 volt relay | C3 | 220 ufd 50vdc |



Weekly ARES Net
7 PM Monday Evening
146.535 simplex
Scott ARES Training Net

Popular Digi Changes

Changes for FT8 and MSK144

WSJT-X co-developer Joe Taylor, K1JT, has announced that major changes are coming to the FT8 and MSK144 digital protocols when *WSJT-X* version 2.0 arrives in a few months. Taylor said version 2.0 should be ready by January <<https://physics.princeton.edu/pulsar/k1jt/wsjsx.html>>.

“Much of the necessary programming is finished,” Taylor said in a post to the Packrats reflector. “Many of the new features have been tested on the air, and we find them to work well.”

Taylor was quick to point out that the new capabilities are not yet publicly available, not even in beta form. He said that he, Steve Franke, K9AN, and Bill Somerville, G4WJS, have been developing “enhanced versions of the MSK144 and FT8 protocols that extend the message payload to 77 bits.”

“Don’t rush to download something,” he cautioned.

“There is more testing and code optimization to do.” He said current plans call for a beta-testing period “probably starting in mid-to-late September,” with a full release “possible a couple of months later.”

Taylor ticked off a few possibilities *WSJT-X* version 2.0 will bring to the table:

- + ARRL Field Day operation with standard Field Day exchanges.
- + ARRL RTTY Roundup operation with standard contest exchanges.
- + North American VHF contest operation with full support of grid exchanges and rover (/R) call signs.
- + European VHF contest operation with the exchange of six-digit grids, QSO serial numbers, and portable (/P) call signs.
- + Better and more user-friendly support for compound and nonstandard call signs.

A special “telemetry” message format for exchanging arbitrary information up to 71 bits.

Support for the existing “FT8 DXpedition Mode,” with a more powerful DXpedition Mode possible too.

“All of these features work seamlessly and automatically,” Taylor said. “No ‘contest mode’ checkboxes are needed. In most situations, decoding sensitivity will be slightly better than at present for FT8; for MSK144 it will sometimes be about 0.5 dB worse. Occupied bandwidths will be the same as they are now, and false-decode rates will be significantly lower.”

Taylor said *WSJT-X* version 2.0 will be available in time for users to digest the new documentation and to practice using the



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First Thursday Net

Metro District Hospital Net

The Metro District ARES Hospital net is held on the first Thursday of each month. The purpose of the net is to provide an opportunity to exercise Dual-band xcvrs installed at hospitals and clinics in the metro area. The net is open to all amateur radio ops and provides the opportunity to participate in a directed net and practice directed net procedures.

Everyone is welcome!

- First Thursday of each month
- 12:30PM (lunch time)
- 146.700 - (PL118.8)



cont'd from col 1

software before actually using it on the air, but he offered one important caveat. “The new protocols cannot be backward compatible with the existing ones,” he said in his post. “We will probably provide some temporary ‘bilingual’ capability for FT8, but not for MSK144. It will be essential for users to upgrade to version 2.0 in order to use the new features and communicate with others who have made the upgrade.”

Taylor promised “plenty of advance notice” about the transition period and a must-upgrade-by date

BREAK - OVER

Q: A dead female body lies at the bottom of a multistory building. It looks as though she committed suicide by jumping from one of the floors.

When the detective arrives, he goes to the first floor of the building, opens the closed window, and flips a coin towards the floor. He goes to the second floor and does the exact same thing. He continues to do this until he gets to the top floor of the building.

When he comes back down, he states that it was a murder and not a suicide. How does he know that?

Phishing the Fish Tank!

Nordic Semiconductor

Another high-profile IoT security breach has hit the headlines as hackers used a connected fish tank to steal data from a North American casino. What lessons can we learn?

The headline of this story might sound like a Hollywood movie, but this storyline is very real. Although the casino has not been named, cybersecurity company Darktrace who uncovered the breach have revealed details of the hack.

A connected fish tank - Hooking up a fish tank to the internet in a home might seem somewhat lavish, but in a commercial setting there's a lot of sense. The smart tank could be remotely monitored and alert someone when maintenance is required.



It could also reduce maintenance, as the computer could automatically adjust temperature and salinity, and even automate the release of feed. However, in the instance of an American casino, it also allowed hackers in to the casino through the back door, and access a database believed to hold information about some of the casino's biggest spenders.

"The attackers used that to get a foothold in the network," Eagan said at a Wall Street Journal panel as reported in a Mashable.com article. "They then found the high-roller database and then pulled that back across the network, out the thermostat, and up to the cloud."

The breach was only discovered once Darktrace reviewed the casino's networks. The unusual activity was picked up almost immediately, as it was sending data to a remote server in Finland using protocols that are normally reserved for streaming media.

Another vulnerability identified - The story is the latest in an increasingly public list of Internet of Things security breaches. We've written before that just one weak spot in one appliance could expose an entire home or business network to unwanted intruders. In 2016, security researchers uncovered a huge botnet— a hacked network using computers remotely to send out spam – of over 100,000 devices. The network included smart televisions and even a smart fridge.

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Surf's Up!

Surfing the web for interesting topics related to radio, building, computing, and anything else interesting along the way

SDR Complete!

www.analog.com/media/en/training-seminars/design-handbooks/Software-Defined-Radio-for-Engineers-2018/SDR4Engineers.pdf

Analog Devices has introduced a free for download book detailing software defined radio.

The objective of this book is to provide a hands-on learning experience using Software Defined Radio for engineering students and industry practitioners. This book is written for both industry practitioners who are seeking to enhance their skill set by learning about the design and implementation of communication systems using SDR technology. The book contains theoretical explanations about and practical hands-on examples and lessons.

Addohms Builds an Arduino

<https://www.baldengineer.com/addohms-tutorials>

This video is part one of a 3 part series. When it's time to design a custom PCB for your project, you might be wondering how to design in an Arduino. This video shows the pieces that go into the schematic. The next video will show how to layout the PCB. And after the boards come back, I will show how to turn it on.

The first episode is located here: www.youtube.com/watch?time_continue=4&v=5fvdxd0QhTw

The second episode is here: www.youtube.com/watch?v=mY8NE3OuPmM

The project 'lights up' here: www.youtube.com/watch?time_continue=1&v=QZY1anoUnA

Ultimate Battery Backup Hack/Mod

<https://www.youtube.com/watch?v=-Ur-D37-juo&t=16s>

Take an APC battery backup and modify it to have 3 direct DC output jacks as well as an LED display with voltage readout. This gives me a power supply for a HAM radio as well as many other useful capabilities during a power outage.



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One Forbes.com contributor said of the casino hack, "Many of the connected devices for sale today are seriously lacking when it comes to security. They're under constant attack from the moment they're hooked up to the Internet and can fall under hacker control within minutes."

BREAK - OVER

SSTV from ISS

More Slow-Scan TV transmissions from the International Space Station are just ahead.

Russian cosmonauts on the International Space Station are expected to activate Amateur Radio Slow-Scan Television (SSTV) transmissions on 145.800 MHz FM on July 30 and 31. The SSTV experiment should be active on Monday, July 30, 1600 - 1930 UTC, and Tuesday, July 31, 1325 - 1915 UTC, using the RS0ISS call sign. SSTV images will be transmitted using the Kenwood TM-D710 transceiver in the Russian ISS Service Module. Format is expected to be PD-120. More information on SSTV from the ISS is on the AMSAT-UK website < <https://amsat-uk.org/beginners/iss-sstv/>>.

All you need to do to receive SSTV pictures direct from the space station is to connect the audio output of a scanner or amateur radio transceiver via a simple interface to the soundcard on a Windows PC or an Apple iOS device, and tune in to 145.800 MHz FM. You can even receive pictures by holding an iPhone next to the radio loudspeaker.

On Windows PC's the free application MMSSTV < <http://hamsoft.ca/pages/mmsstv.php>> can be used to decode the signal, on Apple iOS devices you can use the SSTV app < <https://itunes.apple.com/gb/app/sstv/id387910013>> for compatible modes. For Linux systems try QSST < <https://sourceforge.net/projects/qsstv/>>.

The ISS puts out a strong signal on 145.800 MHz FM and a 2m handheld with a 1/4 wave antenna will be enough to receive it. The FM transmission uses 5 kHz deviation which is standard in much of the world. In IARU Region 1 (British Isles, Europe, Africa) FM equipment is usually set by default to the narrower 2.5 kHz deviation.

Many FM rigs can be switched between wide and narrow deviation FM filters. For best results you should select the filter for **wider** deviation FM. Handhelds all seem to have a single wide filter fitted as standard.

During most of a pass the ISS may be more than 15 degrees above the horizon so an antenna with a high radiation angle will give better results. Simple antennas such as an outdoor 1/4 wave ground plane or dipole should give good results. Large 2m colinear antennas don't work quite as well because their radiation pattern is concentrated at the horizon.

The ISS Fan Club website < <https://www.issfanclub.com>> will show you when the space station is in range. Read ISS SSTV Video and "ISS SSTV Reception Hints" by John Brier KG4AKV at < <https://spacecomms.wordpress.com/iss-sstv-reception-hints>>

BREAK - OVER

Take a Dip in the General Pool

Time to test your knowledge of the information covered by the General Class license exam. Each month we'll take a look at a selection from the question pool.

Strap on your thinking cap and see what you can recall. Here is this month's sample:

1. What is the output PEP of an unmodulated carrier if an average reading wattmeter connected to the transmitter output indicates 1060 watts?
A. 530 watts
B. 1060 watts
C. 1500 watts
D. 2120 watts
2. What is the RMS voltage across a 500-turn secondary winding in a transformer if the 2250-turn primary is connected to 120 VAC?
A. 2370 volts
B. 540 volts
C. 26.7 volts
D. 5.9 volts
3. What is a common name for an inductor used to help smooth the DC output from the rectifier in a conventional power supply?
A. Back EMF choke
B. Repulsion coil
C. Charging inductor
D. Filter choke

(Check next month's issue of the ARES Communicator for the answer.)

BREAK - OVER



She couldn't have jumped from any of the floors because when the detective went to each floor, all of the windows were closed.

June General Pool Answers

1. What is the equivalent capacitance of two 5000 picofarad capacitors and one 750 picofarad capacitor connected in parallel?
D. 10750 picofarads
2. What is the inductance of three 10 millihenry inductors connected in parallel?
C. 3.3 millihenrys
3. Why would it be important to minimize the mutual inductance between two inductors?
B. To reduce unwanted coupling between circuits

BREAK - OVER

Amateur Radio License Exam

Want to become a ham? Want to upgrade your license? You can find information and resources to success in ham radio at this page: <http://www.scottares.org/License Info.htm>

If you want to ask questions or find a local Elmer (Mentor) just drop an email to: newhaminfo@scottares.org

The hams in Scott ARES gather for breakfast the first Saturday of the month at the Perkins Restaurant in Savage.

Bring you ham radio questions and talk to local amateur radio operators.

Now that you have done the work to study for your upgrade, here is where to find a convenient exam session near you. There is a VE exam search engine at: http://www.arrl.org/exam_sessions/search

Walk-ins allowed at most sessions however it is always best to check the details at the specific session you are planning to attend. Below is a list of scheduled sessions close to Scott County. Good Luck!

July 30, 2018 Monday 6:00 PM

Sponsor: SMARTS
Dale A. Blomgren (952) 402-2155
Email: kdzerob@aol.com
Location: Carver County Library
7711 Kerber Blvd
Chanhassen MN 55317
Walk-ins allowed, Pre-reg requested

August 8, 2018 Wednesday 7:00 PM

Sponsor: VARC
James C. Rice (612) 384-7709
Email: jrice@danpatch.org
Location: Perkins Restaurant & Bakery
17387 Kenyon Avenue
Lakeville MN 55044-4459
Walk-ins allowed, Pre-reg requested

August 18, 2018 Saturday 9:00 AM

Sponsor: SEMARC
Daniel M. Franz (651) 769-0358
Email: wd0gup@hotmail.com
Location: Zion Lutheran Church
8500 Hillside Trail South
Cottage Grove MN 55016
Walk-ins allowed, Pre-reg requested

September 12, 2018 Wednesday 7:00 PM

Sponsor: VARC
James C. Rice (612) 384-7709
Email: jrice@danpatch.org
Location: Perkins Restaurant & Bakery
17387 Kenyon Avenue
Lakeville MN 55044-4459
Walk-ins allowed, Pre-reg requested

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September 15, 2018 Saturday 9:00 AM

Sponsor: SEMARC
Daniel M. Franz (651) 769-0358
Email: wd0gup@hotmail.com
Location: Zion Lutheran Church
8500 Hillside Trail South
Cottage Grove MN 55016
Walk-ins allowed, Pre-reg requested

BREAK - OVER

Monday Evening 7PM

The Scott ARES net meets every Monday evening at 7:00 PM either on 146.535 simplex or on the first Monday of the month the WBORMK repeater 147.165 (PL 107.2).

The net is in a directed net format and provides the opportunity to practice working in an emergency net style.

There is help available in setting up and using NBEMS digital messaging software and generally a weekly digital message for practice.

Everyone is welcome to check in and contribute two cents worth!



ARES Breakfast

Saturday
August 11th 2018
7:30AM

Hy-Vee Market Grille,
6150 Egan Dr, Savage, MN

NECOS Schedule July 2017

The first Monday or the month the net is held on the WBORMK repeater, Carver. You will find WBORMK here: 147.165/765 PL 107.2

Date NECOS _____

July 2018

Jul 30th KD0UWZ Chad

August 2018

Aug 6th N0BHC Bob- First Mon. Net

Aug 13th WA0DGW John

Aug 20th KD0UWZ Chad

Aug 27th N0BHC Bob

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