



ARES COMMUNICATOR

Information for Scott County Amateurs



January, 2015

Accurate, Reliable Emergency Communications for our Community

Volume 15, Number 1

Minnesota QSO Party '15

Saturday, February 7th

The Minnesota QSO Party is scheduled for Saturday, February 7, 2015. Let's talk this event up on repeaters, at meetings, and during nets and see how many hams we can encourage to participate.

It's a low key, fun contest that is especially useful for beginners who want to get their feet wet in contesting.

The event runs from 8:00 AM CST (1400 UTC) through 6 PM CST (2400 UTC) on the first Saturday in February.

Minnesota ARES stations are encouraged to participate in the QSO Party. These stations will use "ARES" as their name in the exchange. See the [MN ARES page](#) for information on a new certificate that will be awarded for the top ARES station.

You will find a lot of information that will make the QSO Party more enjoyable at the Minnesota Wireless Assn MN QSO Party website: <http://www.w0aa.org/index.php/mn-qso-party> The page includes real-time tracking info for mobile rover operators as well as logging software that will track your counties worked.



MN QSO Party *cont'd on page 2*

Equipment Cert Rules Changing

FCC moves out of compliance testing

The FCC lab is finally getting out of the equipment certification business. After nearly two years of deliberation, the FCC has adopted new rules modifying its equipment certification procedures. Most notably, it is handing over responsibility for all equipment certification grants to Telecommunications Certification Bodies (TCBs), which currently process more than 98% of grants anyway. Otherwise the FCC's overall equipment authorization process, of which certification is a component, will continue largely as it has in the past, albeit with some important changes.

Most devices that radiate radiofrequency energy, either intentionally or unintentionally, must be tested for compliance prior to marketing in the United States. (Important distinction: the equipment authorization process relates only to the performance of the equipment itself. The goal is to assure that RF devices used in the U.S. comply with applicable FCC-imposed standards – typically power, bandwidth, modulation, out-of-band emissions, RF human exposure limits and, for wireless handsets, hearing aid compatibility. The equipment authorization process does not entail spectrum licensing that may be necessary for the operation of transmitters.)

Under the FCC's rules, there are three types of equipment authorization. The authorization type required for a particular piece of equipment is set in the FCC rules, determined by (a) the likelihood that that equipment will cause harmful interference

Equipment Certification *cont'd on page 3*

ARES Activities

Weekly Net Monday 7 PM 146.535 mhz (s)

Breakfast Saturday, February 14th

Digital Monday, February 16th

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

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Reader submissions encouraged!

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

MN QSO Party - cont'd from page 1

The table below shows the approximate operating frequencies, modes, and best hunting times!

MN QSO Party Hunting Guide

SSB Ops Freq.	CST	GMT
10 SSB 28.450	2:00 PM	2000
15 SSB 21.350	1:00 PM	1900
20 SSB 14.270	All Day!	All Day!
40 SSB 7.250	All Day!	All Day!
80 SSB 3.850	All Day!	All Day!
160 SSB 1.870	5:30 PM	2330

CW Ops Freq.	CST	GMT
10 CW 28.050	Noon	1800
15 CW 21.050	11:00 AM	1700
20 CW 14.050	All Day!	All Day!
40 CW 7.050	All Day!	All Day!
80 CW 3.550	All Day!	All Day!
160 CW 1.850	5:30 PM	2330

BREAK - OVER



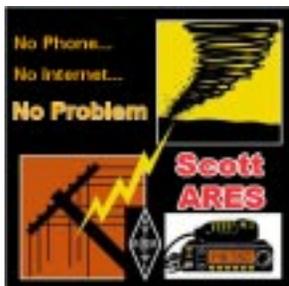
"Whatever you believe with feeling becomes your reality."

Brian Tracy



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United States Citizenship!

Have you ever thought about your United States citizenship? Probably not since that Civics course a long time ago! Foreigners who want to become a United States Citizen must pass a short exam that covers some key concepts important to America. Test your knowledge on the citizenship test.

Check next month for the answer to this month's question.

Why did the colonists fight the British?

- A because they didn't have self-government
- B because of high taxes
- C because the British army stayed in their houses
- D all of these answers
- E the colonies were in debt to Britain and the Crown

wanted the debt repaid

December Citizenship Exam Answer

What does the President's Cabinet do?

- D advises the President

BREAK - OVER

Random Knowledge

Q: What is the difference between et al and et cetera?

A: The Latin phrase et al, short for et alia (and other things) and et alii (and other people), is more specific than et cetera (and the rest). Only et al can refer to people.



Stealth Mothballs



The First F-117 Stealth Fighter has arrived at the bone yard in Tucson. Visitors will not be allowed to climb into the cockpit for liability reasons.

Equipment Certification - cont'd from page 1

and (b) the “significance of the effects of such interference”. The three types of authorization are:

- Certification – This, the most rigorous process for authorization, requires extensive testing of subject equipment. The new rules require testing by an accredited laboratory. (A list of accredited test labs may be found here: <https://apps.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm> If the test results demonstrate compliance, the “responsible party” – usually the manufacturer or importer – forwards the underlying information, along with an application, to a TCB or (until now) the FCC, which reviews the information and, if everything is in order, grants a formal certification. A TCB issuing a certification will also post the application and related materials to an FCC website.
- Declaration of Conformity – This type of authorization also requires testing of the equipment by an “accredited test lab” to confirm its compliance. The results of the testing are not filed with the FCC, and the equipment is not listed in any FCC database; and
- Verification – This is the most streamlined of the authorization processes. Tests may be performed by the manufacturer itself or by any test facility of the manufacturer’s choosing. The test results must then be retained by the manufacturer in its internal records; they need be produced only on request from the FCC.

Under the new rules, the FCC will no longer be issuing certifications. Instead, all applications for certification will have to be submitted to TCBs. The FCC’s Office of Engineering and Technology (OET) will retain oversight of TCBs, and TCBs will have to consult with OET with respect to applications involving certain novel or complex technologies.

Many of the new rules modify how TCBs and test labs operate. The Commission has:

- codified current OET guidance to TCBs;
- tightened accreditation requirements (requiring accreditation for not only all certification test labs and TCBs but also any subcontractors they may use);
- codified criteria for the laboratory accreditation bodies;
- adopted procedures for the validation of test sites; and
- provided for remedial action when TCBs fail to perform properly.

Manufacturers will have to comply with some new changes, most notably for Amateurs:

Post-Market Surveillance: TCBs must be accredited. Accreditation requires that TCBs follow up on their certifications by performing “post-market surveillance”, which entails retesting marketed devices to ensure that they comply in the same way the testing samples did. Under the new rules, a TCB must sample, post-market, at least 5% of the device models it certifies. (That’s consistent with current TCB practice.) To avoid the possibility of excess zeal by competitors, only the TCB that issued the initial certification may call in a product for post-approval re-testing.

cont'd col. 2

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. Here is this month’s sample:

1. Why is the F2 region mainly responsible for the longest distance radio wave propagation?
 - A. Because it is the densest ionospheric layer
 - B. Because it does not absorb radio waves as much as other ionospheric regions
 - C. Because it is the highest ionospheric region
 - D. All of these choices are correct
2. Why is long distance communication on the 40, 60, 80 and 160 meter bands more difficult during the day?
 - A. The F layer absorbs signals at these frequencies during daylight hours
 - B. The F layer is unstable during daylight hours
 - C. The D layer absorbs signals at these frequencies during daylight hours
 - D. The E layer is unstable during daylight hours
3. What is one advantage of selecting the opposite or “reverse” sideband when receiving CW signals on a typical HF transceiver?
 - A. Interference from impulse noise will be eliminated
 - B. More stations can be accommodated within a given signal passband
 - C. It may be possible to reduce or eliminate interference from other signals
 - D. Accidental out of band operation can be prevented

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

December General Pool Answers

1. What factors affect the Maximum Usable Frequency (MUF)?
 - D. All of these choices are correct
2. What is the purpose of the “notch filter” found on many HF transceivers?
 - B. To reduce interference from carriers in the receiver passband
3. What condition can lead to permanent damage when using a solid-state RF power amplifier?
 - D. Excessive drive power

The new rules also provide that TCBs may obtain samples in several ways. TCBs can send someone to the grantee’s factory or warehouse to pick units, at random, for testing. They can require a grantee to supply a voucher that the TCB can use to buy a random equipment sample at retail at no cost to the TCB. And the FCC also plans to tweak its processes to permit a TCB to request samples through the FCC’s equipment authorization system. That last approach puts the FCC’s clout behind the request and is expected to “improve the responsiveness” of the equipment manufacturer. In any event, the FCC will retain authority to request post-market testing.

Snowmobile Safely

Don't Put Your Lights Out!

Great River Energy offers some timely reminders for snowmobile enthusiasts of all ages to be cautious while snowmobiling this winter season. Heavy snow and drifting can bury electrical equipment, causing dangerous situations for snowmobilers.

Remember to be safe:

- Watch out for power poles, guy wires and electrical equipment that can be hidden in the snow. Heavy snowfalls can often bury transformer boxes and cabinets.
- Slow down, know the area where you are snowmobiling and stay on designated, marked trails.
- If you see a downed power line, stay away from it and call 911 to report it. There is no way to tell if a power line is energized just by looking at it. Always assume it is live and can carry currents strong enough to kill.
- Always wait for help to arrive before you approach an accident scene where a power line may be involved.
- Share this important information with family, friends and anyone you know who rides a snowmobile.



BREAK - OVER

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.

Be sure to check to make sure you have the current software on your thumb drive.

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/download.html and <http://www.scottares.org/NBEMS.htm>

Here are the most recent releases as of December 26, 2014.

Software	Version
Fldigi	3.22.03
Flwrap	1.3.4
Flmsg	2.0.6
Flamp	2.2.0

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.



BREAK - OVER

Test Your NIMS Knowledge

This month we will begin our review of ICS-800: National Response Framework. The purpose of the National Response Framework is to ensure that all response partners across the Nation understand domestic incident response roles, responsibilities, and relationships in order to respond more effectively to any type of incident. The Framework focuses on response and short-term recovery instead of all of the phases of incident management.

- Check your recall of the course material with this question.

A basic premise of the National Response Framework is that:

- A. Incidents should be managed at the lowest jurisdictional level possible.
- B. Unity of effort results when responding agencies are willing to relinquish their authorities.
- C. Readiness to act encourages response partners to self-dispatch to an incident scene.
- D. Response partners use nonstandard structures to allow for flexible and scalable responses.

Check next month's ARES Communicator for the solution

December NIMS Knowledge Solution

The National Response Framework is:

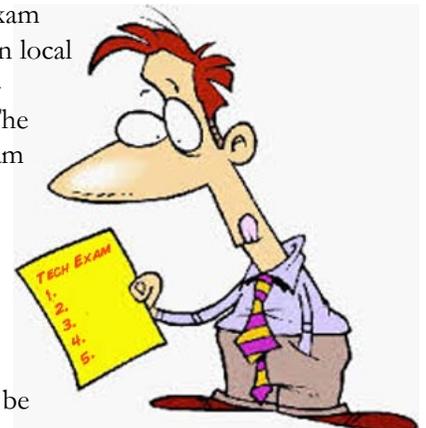
- D. Part of the larger National Strategy for Homeland Security.

Amateur Radio License Exam

Now that you have studied hard, mastered the practice exams, ready to take the license exam? You can find an exam session scheduled by a local Volunteer Examiner group by using the search site at the Amateur Radio Relay League site: http://www.arrl.org/exam_sessions/search

The links to the specific exam session often provide info on local parking, access, and any pre-registration requirements. The examiners are all friendly Ham who want to have a successful exam.

If you are studying and run into some puzzling questions, stop in at the monthly Scott ARES breakfast and the Hams will be glad to help.



BREAK - OVER



Check out this design that actually works!

A. Nony Moose, Tecknickle Correspondent

Greetings antenna fans! Since publishing the 2M Collinear antenna last year this Moose's antlers have been ringing! Turns out the antenna built according to the dimensions was great, if you wanted to communicate on 162 mHz. The dimensions were based on this page: "Emergency Field Antenna: 2-Meter Omni-directional, 1/2 wave collinear design" at <http://home.comcast.net/~buck0/Field2m.htm>

Your Tecknickle Correspondent has been busy cutting, stripping, soldering, measuring, and repeating over the past months. The discoveries made will make for a series of articles that may take some of the mysteries out of antennas that use a quarter-wave twinlead matching section. Have you ever wondered why that "Twinlead J-Pole roll-up antenna" didn't work? Follow the series and you may find out the cause.

For those of you who want to get right to the good stuff, the diagrams illustrate the dimensions for a 2M Collinear antenna that works.

A disclaimer. To those of you who happen to be uncomfortable with 'Perkins Restaurant napkin estimations', stop reading and go back to your text on theoretical biochemical free radical analysis and synthesis. Those who want to tag along and have some fun, lets get stated.

Attempting to adjust the original antenna design to resonate within the 2M ham band was abandoned. There are just too many variables being specified too far outside practical values to get to a final antenna design.

Blow it up and start from a dipole was the approach taken. This involved taking approximately 25 ft of RG58C/U coax, installing a PL259 on one end and stripping the other end to expose about 1/2" of both the center conductor and shield and tinning each. Now for some napkin math. Two meters is slightly longer than six feet. A halfwave dipole would be slightly longer than three feet, or 37 inches. Let's start there.

A. Nony made a loop on the end of the antenna elements by stripping about an inch and a half of the insulation, wrapping two turns around a soldering tool about 3/16" diameter and soldering the loop. This provides a nice way to connect a piece of mason line (nylon string) to hang the antenna for testing.

The half-wave dipole's two legs were soldered one to the center conductor and one to the shield of the coax. The end to end length of the antenna was about 36 3/4", including the 'gap' where the coax was connected.

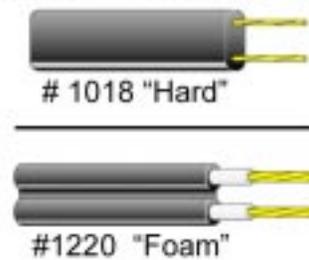
Connecting the coax to the antenna analyzer (MFJ 259C) and after a little 'trimming' (36") showed the lowest SWR occurred at 146 mHz. Right where we wanted to be!

Okay, if we take one half-wave section and wrap it around a 1/2" diameter wood dowel and solder another half-wave above and one below we should have about a six foot antenna with a 2" coil in the center. (More about fine tuning the coil in a minute.)

Well, that's just ducky but how do you attach the coax to the six foot long antenna? This is where the quarter wave twinlead matching transformer comes into play.

You are about to enter the Twilight Zone of the 2M Collinear antenna! We will go into the details in the coming months but

JSC TWINLEAD



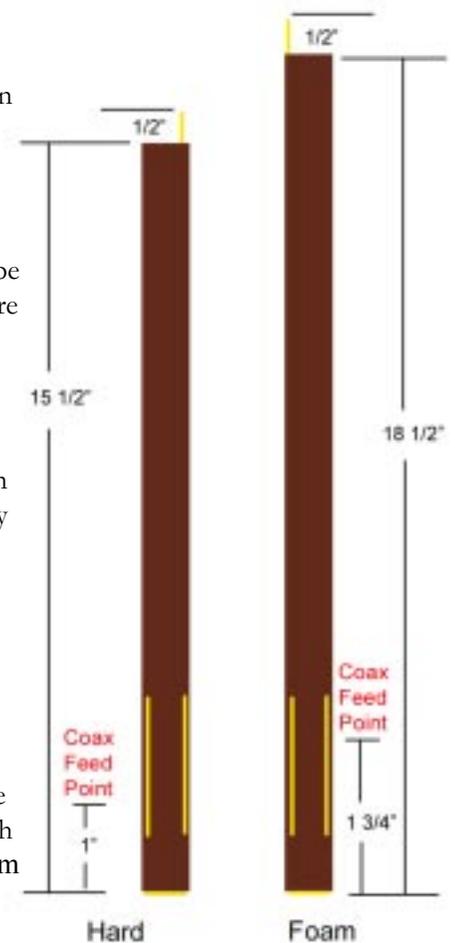
for now take note that there are significant differences in measurements based on the type of twinlead you happen to use.

A. Nony found two main types of twinlead: solid and foam. The electrical characteristics of the two types are VERY different when dealing

with 1/4 wave stubs. Follow the dimensions in the diagrams for the twinlead you happen to have and you should be in the ballpark.

Twinlead can be found from several on-line sellers. It appears that most of it turned out to be manufactured by JSC Wire & Cable (<http://www.jscwire.com>). The flat, heavy duty version was JSC #1018. The lighter duty, foam version was JSC #1220. A. Nony Moose ordered the twinlead used for the testing from BuxCom: (www.packetradio.com/catalog/index.php). The Moose does not endorse any specific seller and provides the info because it seems difficult to search out a supplier for 300 ohm twinlead.

1/4 wave Matching Stubs



Construction Notes:

The materials list is provided to allow interested builders identify

Collinear - cont'd from page 5

Materials Used / Sources

20 ga. Stranded wire

Consolidated Wire & Cable
<http://www.allelectronics.com/>

300 ohm Twinlead

JSC #1018 - Hard
JSC #1220 - Foam
www.packetradio.com

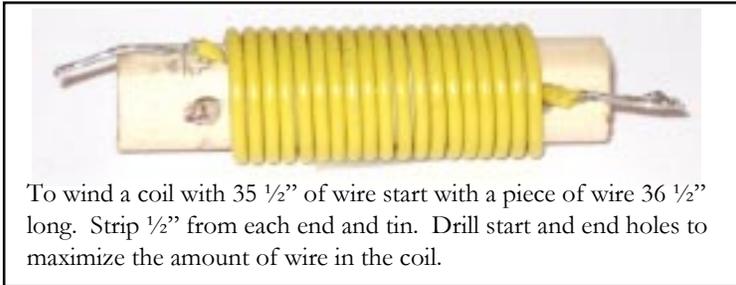
RG58 C/U coax Davis RF

<http://www.amateurradiosupplies.com>

1/2" dia. Softwood dowel

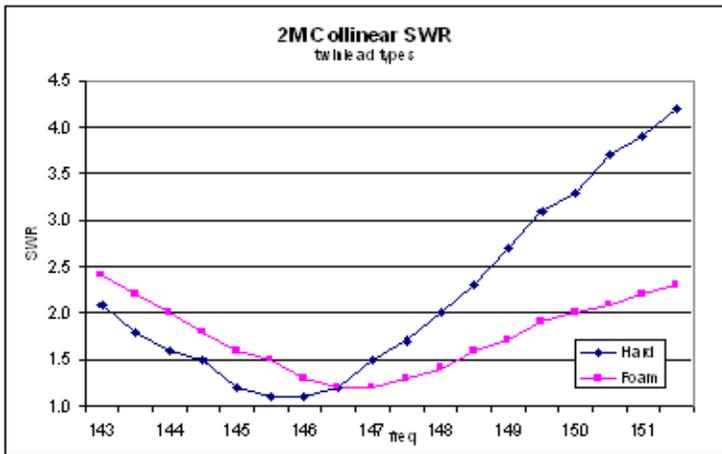
Home Depot - local

the specific materials and sources used. The length of wire used in the coil was 35 1/2" in length. This change was made thru experimentation. The shorter coil produced a lower SWR and somewhat narrower bandwidth. See the diagram for the details of coil winding, etc.



To wind a coil with 35 1/2" of wire start with a piece of wire 36 1/2" long. Strip 1/2" from each end and tin. Drill start and end holes to maximize the amount of wire in the coil.

The dimensions for the two types of twinlead are significantly different. These dimensions do work in the real world. Check the SWR curves.



This article provides the info needed to heat up the soldering iron and build an antenna. Future articles will further explain the process in more detail and the reasons behind the choices. A. Nony will try to stick with the Perkins Napkin math but will put in enough formulas to make it interesting for the theoretical physicists. If you enclose this antenna in a PVC pipe, be prepared for some unexpected changes! If you build this antenna A. Nony Moose would like to hear your constructive feedback. He occasionally checks the mailbox at: Moose@scottares.org.

BREAK - OVER

Zap 'em Sailor

U.S. Navy deploys laser weapon

The laser goes from the weapon of tomorrow to the weapon of today as the US Navy announces the completion of its successful deployment of the Office of Naval Research's (ONR) Laser Weapon System (LaWS). The deployment is the first on a US Naval vessel and took place on the USS Ponce (LPD-15) in the Arabian Gulf from September to November of last year.

According to the Navy, LaWS is capable of handling small attack boats, unmanned aerial vehicles (UAV), and other asymmetric targets, and has a wide range of settings, ranging from the ability to "dazzle" people and sensors without destroying them, to being able to disable or destroy targets. It also has the advantages of being able to engage targets at the speed of light, not requiring ammunition, being able to operate so long as power is available, and has a cost-per-round of about a dollar per shot - which is a considerable saving in an area when munitions can cost thousands or even millions apiece.

According to Rear Adm. Matthew L. Klunder, chief of naval research, this helps to ensure that the US Navy and Marines are never in a "fair fight."

This deployment was a joint mission by ONR, Naval Sea Systems Command, Naval Research Laboratory, Naval Surface Warfare Center Dahlgren Division and private industry. During its time at sea, the laser was used against a



variety of targets, such as small boats and other moving targets at sea, and also managed to knock a flying Scan Eagle UAV out of the sky.

The Navy says that the LaWS exceeded expectations not only in reliability, but in maintainability as well, and it integrated seamlessly with the Ponce's existing defense systems. In addition, sailors aboard said that it performed flawlessly in all weathers, including high winds, heat and humidity.

The deployment is part of the system's development following demonstrations in 2011 and 2012. The results of the deployment will be used to assess the progress of the program and determine future development timeframes. The ONR sees the system as not only applicable for sea duty, but also as an effective defense against airborne and ground-based weapon systems.

"Laser weapons are powerful, affordable and will play a vital role in the future of naval combat operations," says Klunder. "We ran this particular weapon, a prototype, through some extremely tough paces, and it locked on and destroyed the targets we designated with near-instantaneous lethality."

BREAK - OVER

Quick Training Tips

Station-to-Station Contacts

Successful communications rely on some basic rules that we just assume to be universally followed. For example, in English speaking countries, we start reading at the upper left corner of the page and decipher the message word by word moving from left to right one line at a time. We move down the page one line at a time, always reading from left to right.

We have adopted these 'rules' since we first started reading "See dick run".

If someone handed you a printed message that stated with the first word in the center of the sheet of paper and the text coiled around the first word in an expanding spiral, you could probably figure out the message. Eventually. Given enough time you could probably transcribe the text into the familiar format and interpret the message.

In emergency communications we don't have the time to unwind the message and cannot risk the possibility of errors. Our goal in emergency communications is to move information from point A to point B as accurately, rapidly, and efficiently as possible. We develop operating procedures in ecom that are designed to meet those goals. Examples include; using a standard phonetic alphabet, operational prowords such as over, out, and roger, and directed net operation.

The directed net procedure for station to station contact is vital to accurate, efficient movement of information within the network. The basic rule for station-to-station contact is the station being called answers first under direction of the NECOS.

Information moves when one station contacts another station under the direction of the NECOS. Let's take a look at the process via this example.

- KN0NOB calls NECOS, "Request permission to call AA0X, OVER"
- NECOS responds, "KN0NOB call AA0X, OUT"
- AA0X responds, "AA0X, OVER"
- KN0NOB communicates his information, ending dialogue with the proword "OUT".
- NECOS resumes net control when he hears the proword OUT signaling the end of the contact.

This procedure connects the two stations as rapidly and reliably as possible. In a directed net, all stations are monitoring the net traffic. Assuming communications conditions are good, AA0X hears KN0NOB request communications with him, locates a pencil and pad and prepares for any information from KN0NOB. When instructed by NECOS, the station being called, AA0X, answers first which says, 1. I can hear KN0NOB, 2. I understand that he has communications for me, 3. I'm prepared to communicate with KN0NOB. All that information is transmitted in just two words "AA0X, OVER".

If communications conditions were bad and AA0X didn't hear KN0NOB well enough for reliable communications message he would have answered, "AA0X, will need a relay, OVER". This

alerts NECOS and all other stations in the network that they need to relay some information if requested by AA0X. KN0NOB could continue with his dialogue and rely on others to relay any information that AA0X could not copy or wait for conditions to improve.

The procedure is basically the same when message traffic is involved.

- KN0NOB calls NECOS, "I list one routine for AA0X, OVER"
- NECOS responds, "KN0NOB call AA0X and pass your one routine, OUT"
- AA0X responds, "AA0X Ready to copy, OVER"
- KN0NOB passes his message, ending with the prowords "BREAK OVER".
- Assuming error-free copy, AA0X responds, "AA0X Roger, OUT"
- NECOS resumes net control when he hears the proword OUT signaling the end of the contact.

That is the station-to-station procedure in a directed net. The process may seem totally contrary to normal ham operating practice. That's because it is! THE STATION BEING CALLED RESPONDS FIRST.

The procedure has been developed to accomplish the goals of Accuracy, Speed, and Efficiency. Remember, emergency communications is a skill that needs to be practiced regularly to maintain your proficiency.

BREAK - OVER



ARES Breakfast
Saturday February 14th
7:30AM
Perkins Restaurant
Savage, MN

NECOS Schedule January 2015

The first Monday or the month the net is held on the WB0RMK repeater, Carver. You will find WB0RMK here: 147.165/765 PL 107.2

Jan 19 **KC0YHH Tony**
Jan 26 **KB0FH Bob**
February 2015
Feb 2 **N0BHC Bob**
Feb 9 **KD0UWZ Chad**
Feb 16 **KC0YHH Tony**
Feb 23 **KB0FH Bob**
March 2015
Mar 2 **N0BHC Bob**
Mar 9 **KD0UWZ Chad**