



The Fox Cities Amateur Radio Club provides communication support for many public service events in our community. Examples of information being exchanged between the FCARC and event coordinators includes medical emergencies, welfare checks, status reports on participants, or a request for the sag wagon. In order for effective and efficient radio traffic to be passed from the event operators to event officials, the FCARC is asking all participants read the following guidelines before transmitting on your radio for an FCARC communication event.

The first section called Basic Communication Skills is from Amateur Radio Emergency Communications Course – Level I from the ARRL which provides an overview of the basic skills every Ham Radio operator should know to provide emergency communications. Even though this is based on emergency communication, the fundamentals can be used for the FCARC communication events. The second section consists of the FCARC's general radio guidelines and primary focus points of radio traffic during FCARC's public service events created by Andy Palm, N1KSN.

## **Basic Communication Skills\***

**Objective:** This lesson introduces communication skills that are specific to emcomm operations, and helps you understand differences from normal Amateur Radio operations.

**Information:** An emergency communicator must do his part to get every message to its intended recipient, quickly, accurately, and with a minimum of fuss. A number of factors can affect your ability to do this, including your own operating skills, the communication method used, a variety of noise problems, the skills of the receiving party, the cooperation of others, and adequate resources. In this unit, we will discuss basic personal operating skills. Many of the other factors will be covered in later units.

**Why Are Emergency Communication Techniques Different?** Life and death communications are not part of our daily experience. Most of what we say and do each day does not have the potential to severely impact the lives and property of hundreds or thousands of people. In an emergency, any given message can have huge and often unintended consequences. An unclear message, one that is delayed or mis-delivered, or never delivered at all can have disastrous results.

**Listening:** Listening is at least 50% of communication. Discipline yourself to focus on your job and "tune out" distractions. If your attention drifts at the wrong time, you could miss a critical message.

Listening also means avoiding unnecessary transmissions. A wise ham once said, "A ham has two ears and one mouth. Therefore he should listen twice as much as he talks." While you are asking, "when will the cots arrive?" for the fourth time that hour, someone else with a life and death emergency might be prevented from calling for help.



Sometimes the job of listening is complicated by noise. You might be operating from a noisy location, the signal might be weak, or other stations may be causing interference. In each of these cases, it helps to have headphones to minimize local noise and help you concentrate on the radio signal. Digital Signal Processing (DSP) and other technologies may also help to reduce radio noise and interference.

**Microphone Techniques:** Even something as simple as using your microphone correctly can make a big difference in intelligibility. For optimum performance, hold the mic close to your cheek, and just off to the side of your mouth. Talk across, rather than into, the microphone. This will reduce breath noises and "popping" sounds that can mask your speech.

Speak in a normal, clear, calm voice. Raising your voice or shouting can result in over-modulation and distortion, and will not increase volume at the receiving end. Speak at a normal pace \_ rushing your words can result in slurred and unintelligible speech. Pronounce words carefully, making sure to enunciate each syllable and sound.

Radios should be adjusted so that a normal voice within 2 inches of the mic element will produce full modulation. If your microphone gain is set so high that you can achieve full modulation with the mic in your lap, it will also pick up extraneous background noise that can mask or garble your voice. A noise-canceling microphone is a good choice since it blocks out nearly all unwanted background noise, and is available in handheld and headset boom mics. Headset boom microphones are becoming less expensive and more popular, but care should be taken to choose one with a cardioid or other noise canceling type element. Many low-cost headset boom mics have omni-directional elements, and will pick up extraneous noise.

"Voice operated transmission" (VOX) is not recommended for emergency communication. It is too easy for background noise and off-air operator comments to be accidentally transmitted, resulting in embarrassment or a disrupted net. Use a hand or foot switch instead.

When using a repeater, be sure to leave a little extra time between pressing the push-to-talk switch and speaking. A variety of delays can occur within a system, including CTCSS decode time, and transmitter rise time. Some repeaters also have a short "kerchunk" timer to prevent brief key-ups and noise from keying the transmitter. It also gives time for some handhelds to come out of the "power-saver" mode. Leaving extra time is also necessary on any system of linked repeaters, to allow time for all the links to begin transmitting. These techniques will ensure that your entire message is transmitted, avoiding time-wasting repeats for lost first words.

Lastly, pause a little longer than usual between transmissions any time there is a possibility that other stations may have emergency traffic to pass from time to time. A count of "one, one thousand" is usually sufficient.

**Brevity & Clarity:** Each communication should consist of only the information necessary to get the message across clearly and accurately. Extraneous information can distract the recipient and lead to misinterpretation and confusion. If you are the message's author and can leave a word out without changing the meaning of a message, leave it out. If the description of an item will not add to the understanding of the subject of the message, leave it out. Avoid using contractions within your messages. Words like "don't" and "isn't" are easily confused. If someone else has drafted the message, work with the author to make it more concise.



Make your transmissions sound crisp and professional, like the police and fire radio dispatchers and the air traffic controllers. Do not editorialize, or engage in chitchat. An emergency net is no place for "Hi Larry, long time no hear," "Hey, you know that rig you were telling me about last month&." or any other non-essential conversation.

Be sure to say exactly what you mean. Use specific words to ensure that your precise meaning is conveyed. Do not say, "that place we were talking about," when "Richards School" is what you mean. Using non-specific language can lead to misunderstandings and confusion.

Communicate *one complete subject* at a time. Mixing different subjects into one message can cause misunderstandings and confusion. If you are sending a list of additional food supplies needed, keep it separate from a message asking for more sand bags. Chances are that the two requests will have to be forwarded to different locations, and if combined one request will be lost.

**Plain Language:** 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.

Not everyone involved in an emergency communication situation will understand our slang and technical jargon. Even terms used by hams vary from one region to another, and non-hams will have no knowledge of most of our terminology. Hams assisting from another region might understand certain jargon very differently from local hams.

For these reasons, all messages and communications during an emergency should be in plain language. "Q" signals (except in CW communication), 10 codes, and similar jargon should be avoided. The one exception to this is the list of standard "pro-words" (often called "pro-signs") used in Amateur traffic nets, such as "clear," "say again all after" and so on. We will discuss some of these pro-words in detail below, and others later in this course.

Avoid words or phrases that carry strong emotions. Most emergency situations are emotionally charged already, and you do not need to add to the problem. For instance, instead of saying, "horrific damage and people torn to bits," you might say "significant physical damage and personal injuries."

**Phonetics:** Certain words in a message may not be immediately understood. This might be the case with an unusual place name, such as "Franconia" or an unusual last name, like "Smythe." The best way to be sure it is understood correctly is to spell it. The trouble is, if you just spell the word using letters, it might still be misunderstood, since many letters sound alike at the other end of a radio circuit. "Z" and "C" are two good examples. For that reason, radio communicators often use "phonetics." These are specific words that begin with the letter being sent. For instance, "ARRL" might be spoken as "alpha romeo romeo lima."

To reduce requests to repeat words, use phonetics anytime a word has an unusual or difficult spelling, or may be easily misunderstood. Do not spell common words unless the receiving station asks you to. In some cases, they may ask for the phonetic spelling of a common word to clear up confusion over what has been received. Standard practice is to first say the word, say "I



spell," then spell the word phonetically. This lets the receiving station know you are about to spell the word he just heard.

Several different phonetic alphabets are in common use, but most hams and public safety agencies use the ITU Phonetic Alphabet, shown below, and others use military alphabets.

Many hams like to make up their own phonetics, especially as a memory aid for call signs, and often with humorous results. Unfortunately, this practice has no place in emergency communication. In poor conditions, unusual phonetic words might also be misunderstood. We need to be sure that what we say is always interpreted exactly as intended \_ this is why most professional communicators use standardized phonetics.

### ITU Phonetic Alphabet

A - alfa (AL-fa)	B - bravo (BRAH-voh)
C - charlie (CHAR-lee)	D - delta (DELL-tah)
E - echo (ECK-oh)	F - foxtrot (FOKS-trot)
G - golf (GOLF)	H - hotel (HOH-tell)
I - india (IN-dee-ah)	J - juliet (JU-lee-ett)
K - kilo (KEY-loh)	L - lima (LEE-mah)
M - mike (MIKE)	N - november (no-VEM-ber)
O - oscar (OSS-cah)	P - papa (PAH-PAH)
Q - quebec (kay-BECK)	R - romeo (ROW-me-oh)
S - sierra (SEE-air-rah)	T _ tango (TANG-go)
U - uniform (YOU-ni-form)	V - victor (VIK-tor)
W - whiskey (WISS-key)	X - x-ray (ECKS-ray)
Y - yankee (YANG-key)	Z - zulu (ZOO-loo)

Numbers are somewhat easier to understand. Most can be made clearer by simply "over-enunciating" them as shown below.

One: "Wun"	Two: "TOOO"
Three: "THUH-ree"	Four: "FOH-wer"
Five: "FY-ive"	Six: "Sicks"



Seven: "SEV-vin" Eight: "Ate"  
 Nine: "NINE-er Zero: "ZEE-row"

Numbers are always pronounced individually. The number "60" is spoken as "six zero," not "sixty." The number "509" is spoken as "five zero nine," and not as "five hundred nine" or "five oh nine."

**Pro-words:** Pro-words, called "pro-signs" when sent in Morse Code, are procedural terms with specific meanings. They are used to save time and ensure that everyone understands precisely what is being said. Some pro-words are used in general communication, others while sending and receiving formal messages. We will discuss the general words here, and cover the formal message pro-words in a later unit.

Voice	Morse Code*	Meaning and function
Clear	SK	End of contact. In CW, SK is sent before final identification
Over	AR	Used to let a specific station know to respond
Go ahead	K	Used to indicate that any station may respond
Out	CL	Leaving the air, will not be listening
Stand by	AS	A temporary interruption of the contact
Roger	R	Indicates that a transmission has been received correctly and in full

Two letters are sent as one character

Source: ARES Field Manual

**Tactical Call Signs:** Tactical call signs can identify the station's location or its purpose during an event, regardless of who is operating the station. This is an important concept. The tactical call sign allows you to contact a station without knowing the FCC call sign of the operator. It virtually eliminates confusion at shift changes or at stations with multiple operators.

Tactical call signs should be used for all emergency nets and public service events if there are more than just a few participants.

The NCS may assign the tactical call sign as each location is "opened." Tactical call signs will usually provide some information about the location or its purpose. It is often helpful if the tactical call signs have a meaning that matches the way in which the served agency identifies the location or function. Some examples are:



- "Net" for net control
- "Springfield EOC" for the city's Emergency Operations Center
- "Firebase 1" for the first fire base established, or a primary fire base
- "Checkpoint 1" for the first check point in a public service event
- "Canyon Shelter" for the Red Cross shelter at Canyon School
- "Repair 1" for the roving repair vehicle at a bike-a-thon
- "Mercy" for Mercy Hospital

**Calling with Tactical Call Signs:** If you are at "Aid 3" during a directed net and want to contact the net control station, you would say "Net, Aid 3" or, in crisper nets (and where the NCS is paying close attention), simply "Aid 3." If you had emergency traffic, you would say "Aid 3, emergency traffic," or for priority traffic "Aid 3, priority traffic."

Notice how you have quickly conveyed all the information necessary, and have not used any extra words.

If you have traffic for a specific location, such as Firebase 5, you would say "Aid 3, priority traffic for Firebase 5." This tells the NCS everything needed to correctly direct the message. If there is no other traffic holding, the NCS will then call Firebase 5 with, "Firebase 5, call Aid 3 for priority traffic."

Note that no FCC call signs have been used so far. None are necessary when you are calling another station.

**Station Identification:** In addition to satisfying the FCC's rules, proper station identification is essential to promoting the efficient operation of a net. The FCC requires that you identify at ten-minute intervals during a conversation and at the end of your last transmission. During periods of heavy activity in tactical nets it is easy to forget when you last identified, but if you identify at the end of each transmission, you will waste valuable time. What to do?

The easiest way to be sure you fulfill FCC station identification requirements during a net is to give your FCC call sign as you complete each *exchange*. Most exchanges will be far shorter than ten minutes. This serves two important functions:

- 1) It tells the NCS that you consider the exchange complete (and saves time and extra words)
- 2) It fulfills all FCC identification requirements.

**Completing a call:** After the message has been sent, you would complete the call from Aid 3 by saying "Aid 3, <your call sign>." This fulfills your station identification requirements and tells the NCS that you believe the exchange to be complete.

If the Net Control Station believes the exchange is complete, and Aid 3 had forgotten to identify, then the NCS should say, "Aid 3, do you have further traffic?" At that point, Aid 3 should either continue with the traffic, or "clear" by identifying as above.



## **A Review of Habits to Avoid**

- Thinking aloud on the air: "Ahhh, let me see. Hmm. Well, you know, if&"
- On-air arguments or criticism
- Rambling commentaries
- Shouting into your microphone
- "Cute" phonetics
- Identifying every time you key or un-key the mic
- Using "10" codes, Q-signals on phone, or anything other than "plain language"
- Speaking without planning your message in advance
- Talking just to pass the time.

\*Reference

Amateur Radio Emergency Communications Course – Level I p 37-50

## **FCARC's general radio guidelines and primary focus points of radio traffic during FCARC's public service events created by Andy Palm, N1KSN.**

*- Listen before transmitting.*

*- When you have a transmission to make, call net control by just saying your callsign and then wait to be recognized.*

*- Speak clearly and distinctly.*

*- Once recognized, say what you need to say and no more. Don't use 30 words when 5 will do--keep transmissions short.*

*- Remember to ID at the end of each exchange (series of back and forth transmissions) to avoid inadvertently breaking FCC regulations on IDing.*

*- Be ready to respond to net control's call at any time during the event.*

*- Let net control know if you will be away from your radio for a while, and let net control know when you are back.*



These guidelines are extra important if we are running simplex, since stations may not be able to hear one another. If net control does not respond to your first call, be patient as another exchange may be taking place.

The FCARC's primary radio traffic will be concerned with (in roughly decreasing order of priority):

- *Medical emergencies*
- *Children separated from their group*
- *Requests for rides from the sag wagon*
- *Radio checks*
- *Requests for re-supply of rest stops*
- *Requests to secure rest stops*
- *Reports on stragglers*
- *Reports on first walkers*
- *Requests to secure a station*

Finally, remember that part of the fun is knowing that although we are called radio amateurs, we provide a professional-grade service to our clients.



## Communications Readiness

To participate in a Fox Cities Amateur Radio Club communications event you should be aware of the minimum and recommended equipment needed to effectively communicate with Net Control. Along with radio equipment you should have the proper supplies to help you make it through the event without any major problems.

1. Radio Types
  - a. 2 Meter – Minimum
  - b. 2 Meter/440 - Recommended
  - c. Handheld for portable use
  - d. Mobile radio for fixed or mobile use
2. User Manual
  - a. Original – Minimum
  - b. Copy in binder – Recommended
  - c. Digital - Optional
    - i. Laptop
    - ii. Tablet (i.e. I-Pad)
3. Antennas
  - a. Handheld
    - i. Stock - Minimum
    - ii. “Enhanced” handheld antenna - Recommended
    - iii. J-pole - Optional
    - iv. Quad antenna - Optional
    - v. Magnet Antenna - Optional
  1. Recommended when being used in Sag or Supply vehicle
  - b. Mobile or Fixed station



- i. Use appropriate antenna for mobile or fixed station
      - c. Radio memories are programmed for (see appendix a for local frequency list):
        - i. Event frequency – Minimum
        - ii. Local Repeaters - Recommended
        - iii. National Simplex – Recommended
        - iv. Local police, fire, ambulance –Optional
        - v. NOAA weather – Optional
      - d. Accessories
        - i. Speaker Microphone or Headset Microphone – Recommended
        - ii. Extra battery pack – Recommended
        - iii. Antenna adapters – Optional
          1. BNC, SMA, PL-259
4. Maps
  - a. Route – Minimum
    - i. This map should be provided by event coordinator
  - b. Local Area – Recommended
  - c. City – Optional
5. Logistics
  - a. Ham Radio License – Minimum
  - b. FCARC badge - Recommended
  - c. Supplies for notes
    - i. Pen or Pencil
    - ii. Clip board
6. Supplies
  - a. Water and Snack – Recommended
  - b. Basic First Kit – Optional
  - c. Hand wipes – Optional
  - d. Clothing
    - i. Rain Gear – Recommended



- ii. Coat or Sweatshirt – Recommended
- iii. Warm gloves – Optional
- iv. Hat
  - 1. Baseball type – Recommended
  - 2. Winter – Optional
- v. Sunglasses - Optional



## Frequency List

<i>FCARC Repeaters</i>			
Frequency	Offset	PI Tone	Notes
147.760	Minus	107.2	Downtown Receive
147.760	Minus	100.0	
145.330	Plus	100.0	
443.650	Plus	100.0	
<i>Simplex</i>			
145.520			National Calling
145.550			
145.580			
446.000			National Calling
147.555			Club Frequency
<i>ARES</i>			
147.240	Plus	100	Winnebago Co.
146.655	Minus	100	Outagamie Co
147.300	plus	107.2	Calumet Co
<i>Echo Link</i>			
442.175	Plus	100	W9RIC - Darboy
<i>WeComm</i>			
145.290	Plus	114.8	WE9COM
<i>NOAA</i>			
162.400	Rhineland		Green Bay
162.400	Milwaukee		Sullivan
162.425	Sister Bay		Green Bay
162.450	Crandon		Green Bay
162.475	Wausau		Green Bay
162.500	Gresham		Green Bay
162.500	Black River Falls		La Crosse
162.525	New London		Green Bay
162.550	Green Bay		Green Bay
162.550	Madison		Sullivan
For a complete listing, Go to			
<a href="http://www.nws.noaa.gov/nwr/stations.php?State=WI&amp;Sort=WF">http://www.nws.noaa.gov/nwr/stations.php?State=WI&amp;Sort=WF</a>			



### Outagamie County

Frequency	Tone	Alpha Tag	Description
155.415	107.2 PL	OUSO1E	Sheriff Dispatch - East Multicast
155.520	107.2 PL	OUSO1W	Sheriff Dispatch - West Multicast
155.700	107.2 PL	OUSO1C	Sheriff Dispatch - Central Multicast ("Gray")
155.820	107.2 PL	OUSO2	Sheriff 2 Alternate/Information ("Black")
153.845	107.2 PL	OUSO3	Sheriff 3 Mobile 1
153.800	107.2 PL	OUSO4	Sheriff 4 Mobile 2
155.850	107.2 PL	OUSO5	Sheriff 5 Mobile 3/Investigative
155.370	146.2 PL	POINT	Sheriff 9 Point-to-Point
154.250	CSQ	BROWN	Fire "Brown" Dispatch (Sheriff F-6)
154.295		FG BLUE	Fire "Yellow" (FG BLUE)
153.830	107.2 PL	SILVER	Fire "Silver" Countywide Fireground
154.175	91.5 PL	LIME	Fire "Lime" Appleton Fire Fireground
154.385	107.2 PL	GOLD	Fire "Gold" Countywide Fireground
154.430	91.5 PL	VIOLET	Fire "Violet" Appleton Fire Dispatch
155.790	445DPL	APPD Disp	Police 1 Dispatch/Tactical
159.150	156.7 PL	APPD Info	Police 2
155.310	107.2 PL	Merto	Police Dispatch
154.085	82.5 PL	Grand Chute	Police Dispatch

### Winnebago County

Frequency	Tone	Alpha Tag	Description
158.730	162.2 PL	WISO	Sheriff 1 Dispatch
154.800	136.5 PL	Oshkosh PD	Sheriff 2 Oshkosh Police
155.610	146.2 PL	NeenahMenash	Sheriff 3 Neenah-Menasha Police
158.835	162.2 PL	WISOCAR	Sheriff 4 Auxiliary/Reserve/Tactical
155.370	CSQ	POINT	Sheriff 9 Point-to-Point
158.910		OshkoshPDDet	Sheriff 19 Oshkosh Police Tactical
158.775	118.8 PL	WIFIR1	Fire 1 "Red" (to be "Yellow") Dispatch
154.445	136.5 PL	WIFIR2	Fire 2 "Green" Fireground
154.295	CSQ	FG BLUE	Fire 3 "Yellow"
154.325	146.2 PL	WIFIR4	Fire 4 "Orange" Neenah-Menasha Fireground
154.190	136.5 PL	Oshkosh FD	Fire 7 "Silver" Oshkosh Fire
158.940	107.2 PL	Menasha PDW	Police Channel 16/Public Works
155.760	118.8 PL	Neenah DPW	Police Channel 5/Public Works



Gold Cross/Hospitals			
Frequency	Tone	Alpha Tag	Description
453.175	265 DPL	Gold Cross	Gold Cross Ambulance Service Dispatch
155.265	203.5 PL	Gold Cross V	Gold Cross Ambulance Service Tactical
130.075	CSQ	ThedaStar	Theda Clark Memorial Hospital Helicopter Dispatch
155.340	192.8 PL	Theda Clark	Theda Clark Memorial Hospital
155.340	141.3 PL	Theda Clark	Theda Clark Memorial Hospital (Theda Star Helicopter)
462.950	192.8 PL	Theda Clark	Theda Clark Memorial Hospital (Theda Star Helicopter)
463.125	192.8 PL	Theda Clark	Theda Clark Memorial Hospital
155.340	110.9 PL	AMC EMS B	Appleton Medical Center
463.000	192.8 PL	AMC Med 1	Appleton Medical Center
155.340	107.2 PL	St E EMS B	Saint Elizabeth Hospital (Police F-20)
463.025	192.8 PL	St E Med 2	Saint Elizabeth Hospital

Public Service frequencies from <http://www.radioreference.com/>