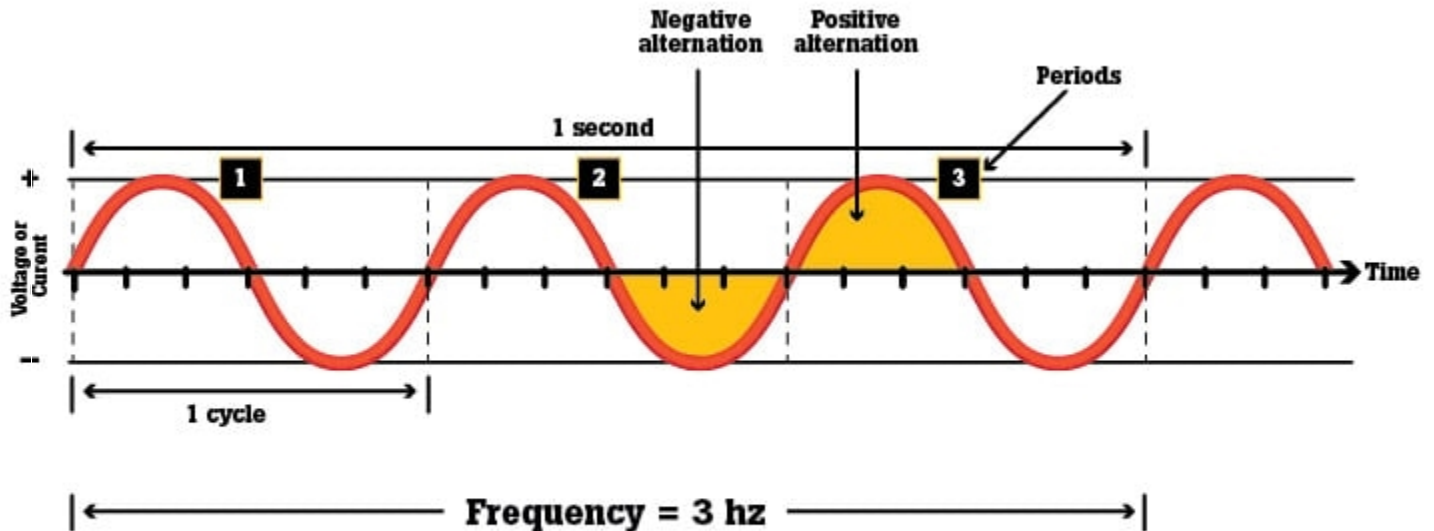


Communications Detail

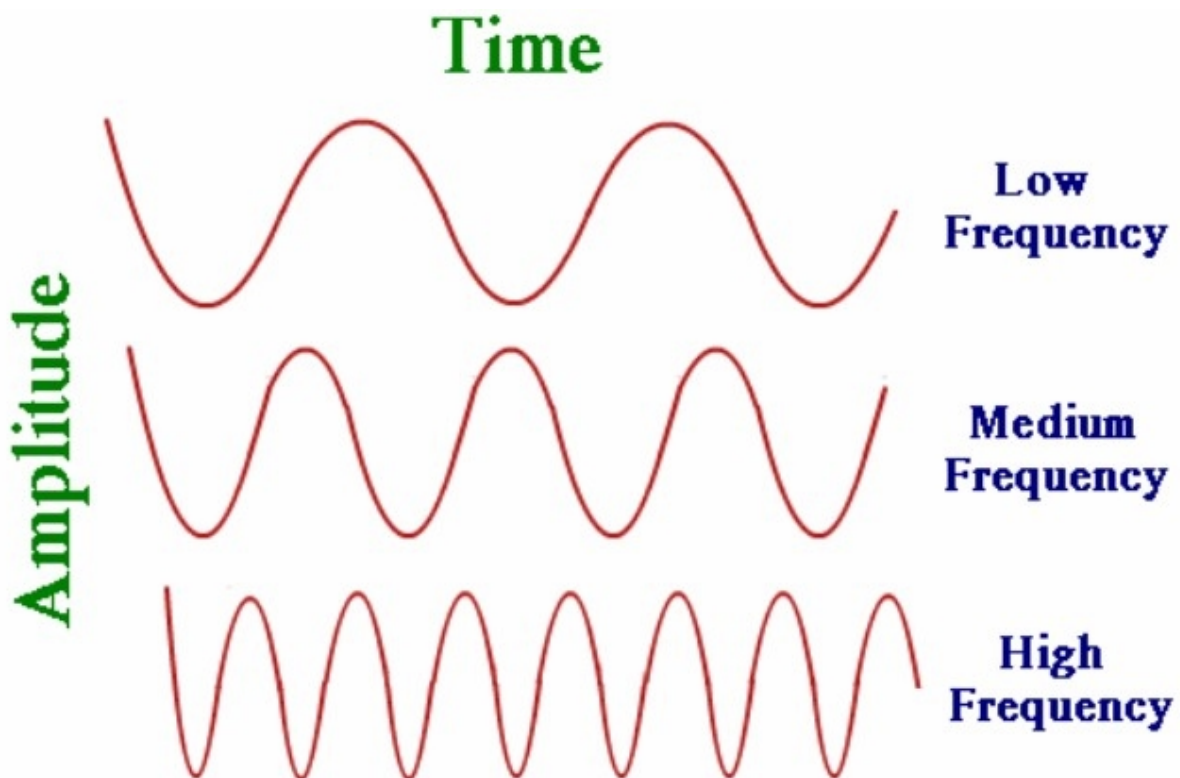
The major disconnect in any emergency or disaster event is communications, followed by a lack of basic preparedness.

Radio Terminology: Frequency and Channel

Frequency: Frequency is the rate at which current changes direction per second. It is measured in hertz (hz), an international unit of measure where 1 hertz is equal to 1 cycle per second. Hertz (hz). = One complete wave of alternating current or voltage.



- The number of these cycles or the frequency (of these cycles)= Frequency
- Wavelength gets shorter as the frequency increases (any one hear of short wave?)



(300 Divided by Frequency = Meter Band)

HF 3-30 MHz / VHF 30-300 MHz / UHF 300-3000 MHz

Classifications of Radio Bands

- | | | |
|----------------|--|----------------------------|
| o FRS | Family Radio Service | No License Required |
| o GMRS | General Mobile Radio Service | Needs Licensing |
| o MURS | Multi Use Radio Service (Business) | |
| o Amateur | Ham Radio | Needs Licensing |
| o Air | Aircraft Communications and Navigation | Needs Licensing |
| o Marine | Vessel (Boat & Ship) Communications | Needs Licensing |
| o Rapid Radios | Uses 4G Telephone Communications | No License Required |

Do Not Interrupt or Interfere With Other Radio Communications!

We will focus on two radio services, others will require in-depth study.

FRS Radios - Family Radio Service *Features of the Motorola T-600 and above*

- o No License Required - You are still required to follow all FCC rules.
- o Simplex operation (Antenna to Antenna)
- o Non Removable Antenna
- o 22 Channels 1-7; 2 Watts, 8-14; half-Watt, 15-22; 2 Watts
- o 22 Channels x 121 Privacy Codes = 2662 "Frequencies" or Channels
- o Privacy Codes are CTCSS Tones (Continuous Tone Coded Squelch System)
- o Always keep your privacy code set to "0".
- o These 22 Channels / frequencies are shared with FRS and GMRS Radios
- o Channel Scanning
- o VOX - Hands Free (We don't recommend the use of VOX) Any sound will cause your radio to transmit any private conversations you may be having and drain your battery.
- o Rechargeable battery + 3 AA Battery use if you cannot charge your radio
- o NOAA Bands (Channel 1 on our area)
- o FRS Radios are Compatible with other FRS and GMRS Radio and Brands with "line of sight" transmissions.

GMRS Radios - General Mobile Radio Service

- o License Required, but no test is required for licensing. Additionally, your family can share the use of this license. The license is good for 10 years.
- o Simplex and Duplex Operation (Antenna to Antenna & Using a Repeater for transmitting greater distances)
- o Removable Antenna
- o More Transmit Power (wattage)
- o 22 Channels + 8 Repeater Channels
- o These 22 Channels / frequencies are shared with GMRS and FRS Radios
- o GMRS Radios are Compatible with other FRS and GMRS Radio Brands

Squelch: Squelch is used in two-way radios and VHF/UHF radio scanners to eliminate the sound of noise when the radio is not receiving a desired transmission.

Privacy Codes = CTCSS (Continuous Tone-Coded Squelch System) Using a Privacy Code Blocks hearing others as well as others not being able to hear you. This is why we say Make sure your Privacy Code is set to "0", which is **NO TONES**. We want to hear you, we want you to hear us. If you have a privacy code set (1-121) you will squelch out all other radios. **Unless we are all set to the same privacy code we cannot communicate.**

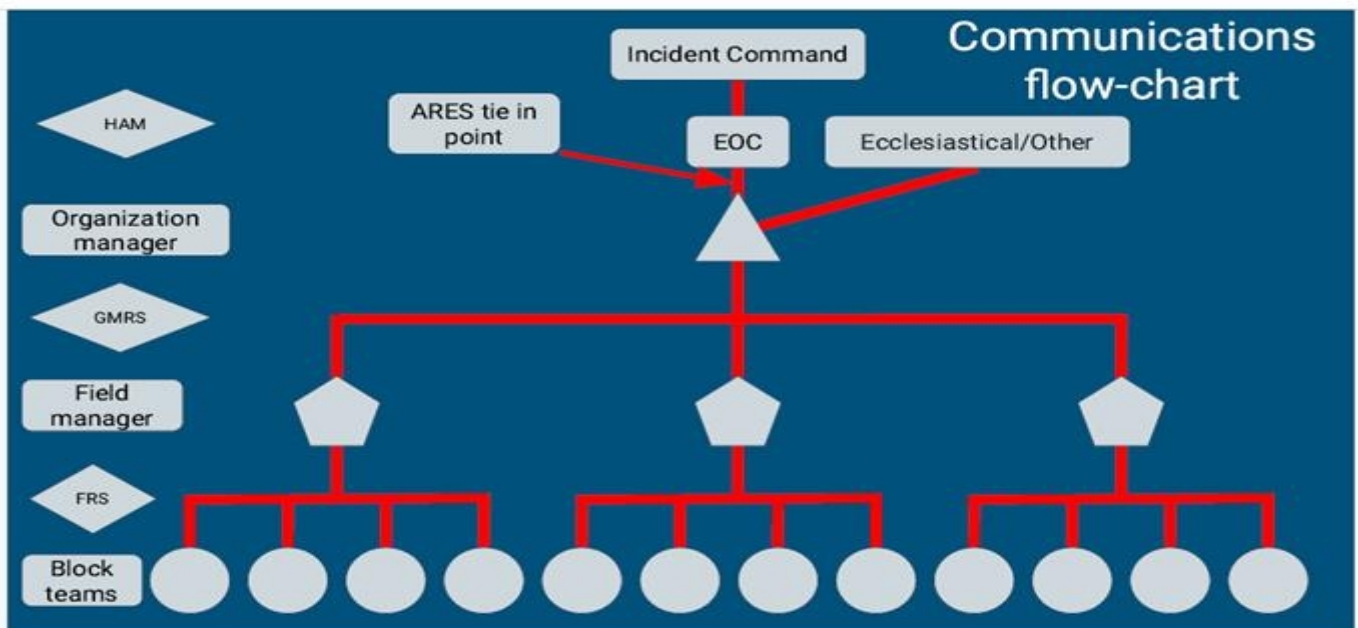
- **Modulation:** MODULATION is an inflection of the tone or pitch of the voice; specifically: the use of stress or pitch to convey meaning. Over modulation and under modulation is essentially shouting into your radio or speaking too softly, or not speaking into the microphone. Speak in a normal voice; Don't whisper or shout.

How To Hold / Use Your Radio:

- Every member of your house-hold should know how to use your radios.
- Hold the radio below or to the side of your mouth to avoid noise from breathing. Keep the microphone element about 1 to 3 inches away from your mouth. Push the "Push-to-talk" (PTT) button, pause, then speak.
- When finished speaking, release the PTT button. Most handheld radios will "Time Out" and will stop transmitting if the PTT button is depressed for 1 minute or longer. For this reason keep your messages concise and to the point.
- For better transmissions and reception you may move by a window, Some radio operators may not be able to hear a distant block check-in, you can assist by relaying any message transmissions.
- Hold the radio approximately two to three inches from your mouth. This distance reduces background noise and improves voice clarity.
- Speak in a normal voice; Don't whisper or shout.

Frequency / Signal Propagation

- Radio waves travel at the speed of light 300M meters per second (or 186,000 miles a second)
- There are 2 components of a radio wave, Electric and Magnetic fields
- They have a specific relationship - electric & magnetic fields of a electromagnetic wave that are at right angles to each other
- The term "Polarization" is used to explain the orientation of the electric field (simply adjusting the angle of your radio can increase / decrease performance.
- Vertically polarized vs Horizontally polarized antennas
- Precipitation might decrease your range (at microwave frequencies)
- Good News: Fog & light rain have little effect on the 10 and 6 meter band
- Vegetation, like leaves, causes absorption of UHF and microwave signals.
- Line of sight: Make sure transmitting antennas and receiving antennas of VHF & UHF are polarized the same or signals could be significantly weaker.
- **Buildings, terrain and other features that obstruct line-of-sight transmission can also cause poor radio signal propagation.**
Change your area, e.g. move by a window.
- Knife Edge Diffraction: Using buildings and terrain to "bounce" signals off...
- INTERFERENCE: Naturally Occurring (QRN), and Man Made (QRM)



Disaster Communications

- Emergency Response Center
- Emergency Operations Center
- Familiarization with Electronic Warning Systems
- NOAA
- In Our Area: KSL 1160AM and 102.7 FM / Official news and information
- Use Assigned Radio Frequencies Only
- WPS (Wireless Priority Service)
- Rapid Radios

Ward / Neighborhood / Local
City / County
Cell, TV, Radio

Other Communication Means and Methods

- Messengers / Runners
- Safe Words
- Family Message Center
- Cell / Text if operable
- "Code Red" / Everbridge or other warning systems
- Code of The Whistle
- Air-To-Ground Markings
- Strobe, Flares, Smoke
- Mirrors (Signaling)

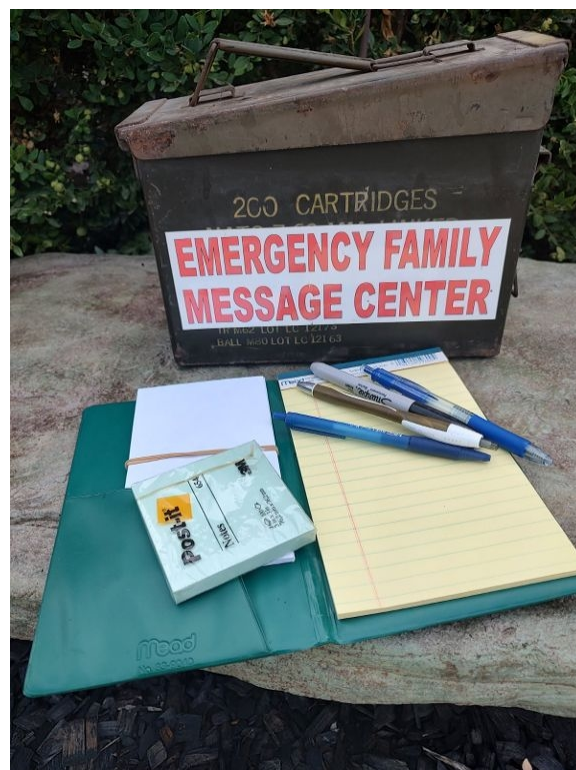
Rapid Radios

Coast To Coast Communications
No Monthly Fees
Uses 4G Towers
Private Groups
Can Talk to the Entire Group
or
Specific Individuals in the group
Will go up to 4 days on a charge
Full Encryption
Will triangulate to find a 4G Tower

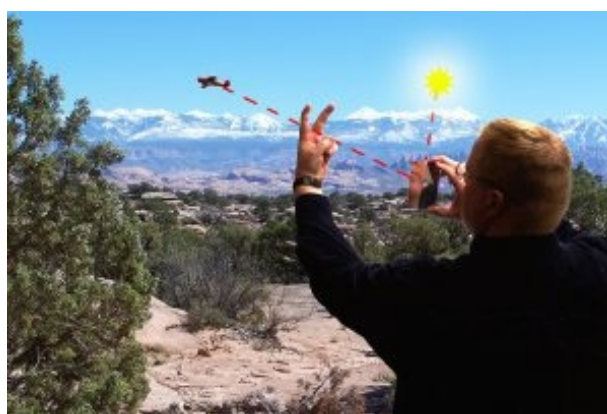
Safe Words are words or phrases that can be slipped into casual conversation. It can be a sport that no one in your family likes, or food that no one likes. Words or phrases slipped into casual conversation can alert family members that something is wrong. Today, over the phone, AI can clone your voice after hearing you for a few seconds. A Frantic phone call from a "family member in distress" asking you for your credit card

number for a seemingly legitimate reason can be thwarted by, "If this is really you, what's our secret word". The conversation ends. For some time we have conditioned our children to question the legitimacy of an unknown adult telling your child, "Your mom wanted me to pick you up after school". Unless the adult knows and says the secret word. The child knows to run away making a lot of noise, getting the attention of other adults.

Family Message Center The family message center is a weatherproof container that can be secured outside on your property. The container has tablets, envelopes, pens, pencils, and a Sharpie®. Family members can leave written messages and instructions. This only works if all family members know where your message center is located, and you check it. An old metal ammunition can works great!



Signal Mirror



INTERNATIONAL SOS WHISTLE CODE

3 Blasts: Distress Call
"HELP ME"

2 Blasts: Call Back
"COME HERE"

1 Blast: Call Back
"WHERE ARE YOU"



**Each whistle blast
should be 3 seconds**

Distress Images



Weekly FRS / GRMS Radio Net Protocol -----

The _____ Weekly ERC Net will begin in _____ Minutes

This is _____ (Name), _____ (Call Sign). I will be serving as Net Control for the _____ (Organization) weekly Emergency Radio Communications Net. Anyone can participate in this net, and visitor check-in's are always welcome! This net meets each _____ (Day of the week) at _____ (Time). This is a directed net. Net control will pause check-ins for any emergency traffic or messages using the appropriate Break Tag.

This is an informal net. The primary purpose of this net is to provide the opportunity for you to become acquainted with your FRS or GMRS radios in case of an actual emergency when telephone service is not working. Weekly radio checks will ensure that your radios are charged and working properly.

We are assigned channel _____.

All residents in this area are encouraged to participate in our weekly radio net. If you are using a GMRS radio please use your name and call sign when checking in.

Before beginning the net tonight are there any stations with emergency traffic? If so please call now. (Wait 5 seconds) Hearing none we will now have block check-ins. / This is _____ (Name), _____ (Call Sign), Your Net controller.

Our ward / Neighborhood has been divided geographically into ____ blocks. Our area map shows what block you are in. A copy of this map can be found at / on _____. When your block is called, please give your first name, followed by your block number and state whether or not you have any traffic for the net. This includes information, announcements, or questions. Net Control will acknowledge you with a signal report such as "I read you loud and Clear, thank you for checking into the net.". If you are not acknowledged by net control, please check-in again. If you have a longer message or announcement, Net Control will provide you time following block check-ins. /

Begin Net Check-ins i.e. Block 1 check in now, Block 2 check in now, Block 3 check in now, etc.

*(Net control now goes through the registered list of previous check-ins from each block)
When participants check-in they need to give their first name and the block number they are in. When finished with the list of names who have checked-in, Net Control will ask for any late or new check-ins. Net Control will add new check-ins to the list each week as more and more people begin to check into the net.*

This concludes our list. Are there any Visitors, New or Late check-ins? PLEASE COME NOW (Wait 5 seconds).

Call upon anyone that has any traffic, message, or announcement (If any).

This concludes this weeks test of the _____ ERC net, We thank you all for participating. This is _____, Net control standing by and the channel is now clear for normal use.

REAL WORLD ERC NET PREAMBLE

This is _____, serving as Net Control for the _____
ERC Net. This net has been activated due to a:

(Event Description) _____

that occurred at _____ Local Time . (State / Report What We Know)

This Net will be monitoring This Frequency / FRS Channel 2 with no privacy code
Continuously, or as determined by local leadership.

(If the Net QSY's, monitor channel 2 for traffic).

BLOCKS SHOULD CHECK-IN EVERY ____ HOURS BEGINNING AT _____ LOCAL TIME
OR AS DIRECTED.

Listen to Official News and updates on your NOAA Radio (Channel #1) or KSL RADIO
1160 AM or 102.7 FM

At any time use the appropriate break tag for breaking reports and provide me time
to report this information to other emergency nets following your report.

Do not repeat Information that has already been reported, unless it is an Update.

Beginning Block check-ins and updates now:

Block 1 Please Come Now.

(Transcribe all Information, and Read it back)

Block 2 Please Come Now.

Block 3 Please Come Now.

Immediately Re-Transmit reports to other E Nets:

Block 4 Please Come Now.

Block 5 Please Come Now.

Stand-by While I Relay this Report"!

Block 6 Please Come Now.

Block 7 Please Come Now.

Block 8 Please Come Now.

(Note: Write all transcribed information on the Net's Rapid Damage Assessment log for Relay Transmissions).

WARD ERC REPORTING TO THE STAKE

Check In as called

-OR-

_____ Stake this is _____, _____ Ward ERC Ready
to Report, over.

-OR-

USE BREAK TAGS

1. Your Call Sign
2. Answer
3. Question
4. Information
5. Priority
6. Medical
7. Emergency

The ERC will report:

- Missionaries and members, as well as their locations.
- Member housing
- Church properties
- The community (including roads, public utilities, commerce, facilities, and other infrastructure).

This information will be communicated via priesthood lines to the
Area Presidency.

Report Information to the _____ Stake.

Distress and Domestic Violence Hand Signal



1. Palm facing outwards,
place thumb on the palm



2. Move fingers down over thumb