

GMRS Radio Training

- This material will be shown at the San Jose Fire Museum on 8/12/2023 - Thanks for attending!
- This will be posted on sjncert.org under communications
- Please send your comments, feedback & suggestions

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D10 Los Paseos CERT
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GMRS Radio Training

- Agenda
 - We have MURS, why do we need GMRS?
 - GMRS Radio Training - Train the Trainers
 - SJ CERT Radio Frequency Assignments & Repeaters
 - How to get your GMRS license
- During this training - feel free to ask questions
- This is not official CERT or FEMA training material

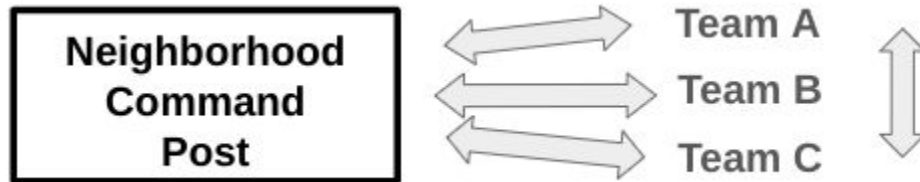
GMRS Radio Training

- Agenda
 - **We have MURS, why do we need GMRS?**
 - GMRS Radio Training - Train the Trainers
 - SJ CERT Radio Frequency Assignments & Repeaters
 - How to get your GMRS license

 - This is follow-on to the MURS Radio Training
- Thank you to all the people who have reviewed this package & provided suggestions!

Radios for emergency communications (EMCOMM)

- Example: CERT & Radios during an Earthquake
 - Your CERT training kicks in
 - Make sure you & your family are safe
 - Next phase - Help our neighbors & the neighborhood
 - Setup CERT Command Post (CERTs & Neighborhood Leaders)
 - Organize Teams to assess situation in the neighborhood (Teams = CERTs + volunteers)
 - Check for injuries & building damage, do welfare checks
 - Use radios for communications between the Command Post & Teams on the ground



Why you need a GMRS radio?

- MURS is good for your local neighborhood
 - To talk with the Neighborhood Teams on the ground
 - To relay information between Teams & Command Post
 - Everyone can use MURS radios - license is not required
- MURS cannot transmit over long distances -> they are low power
- Some neighborhoods may use FRS (more on this later)
- You will need higher power radios to reach outside of your neighborhood
 - These higher power radios are:
 - GMRS = General Mobile Radio Service
 - Amateur Radio (Ham)
 - MURS is not compatible with GMRS & ham radios
 - GMRS & ham radio both need a license, plus ham requires passing test

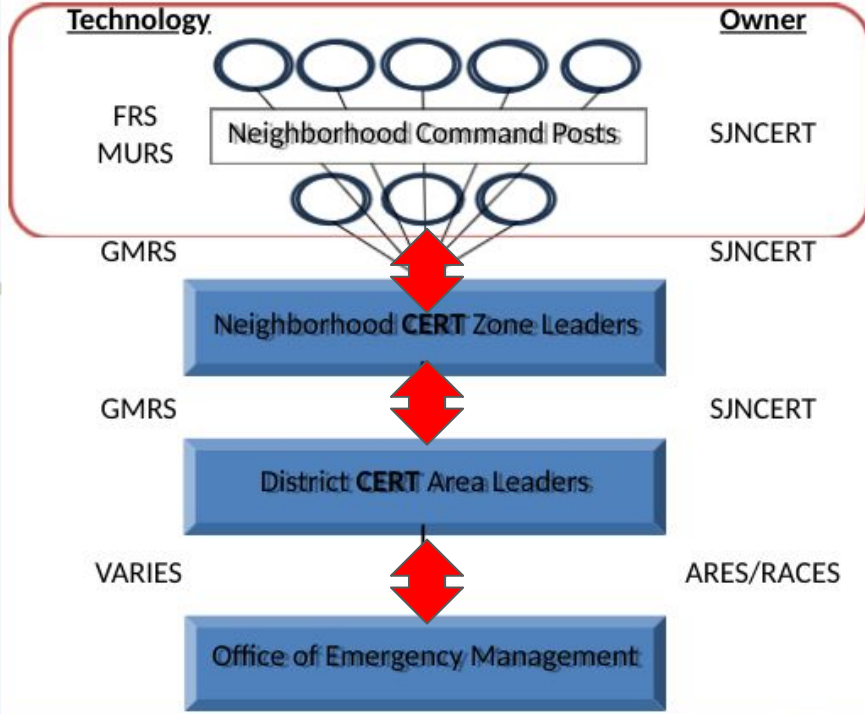
Introduce 2 Terms for the Next Slides

- Chain of Command
 - Organization structure which shows how each level reports to one another
- Radio Hierarchy
 - What radio type (or technology) is used at each level

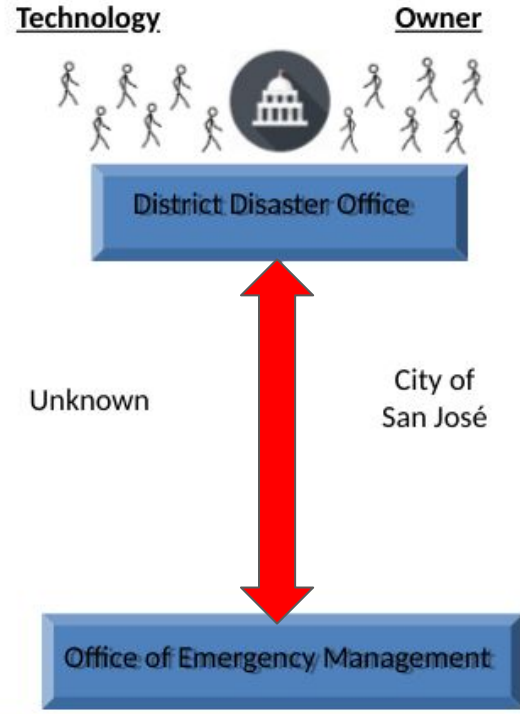
Disaster Communications Responsibilities

L. Steckmest

CERT



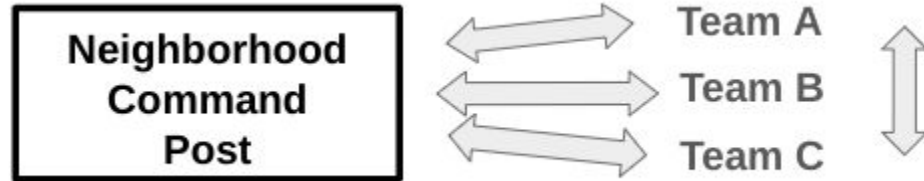
Governmental



Chain of Command

- In a major disaster -> Traditional communications may be DOWN
- ***Use radios to report information up the Chain of Command***
 - To provide information on neighborhood condition & status
 - To request aid and support
- Having radios will not guarantee we will be able to reach the city level and get emergency services
 - But we need to be prepared

Neighborhood Readiness



- How are we doing?
 - Varies from neighborhood to neighborhood
 - CERT training
 - ICS (Incident Command System) training
 - Emergency supplies (including radios)
 - Organization between neighborhoods within district
 - Neighborhood zone leaders
 - District area leaders

GMRS Radio - Why they have greater range

- MURS & FRS radios operate in “simplex” mode
 - When you have a team on a particular channel
 - All radios talk & listen on that same channel
 - When one radio transmits -> all others listen
 - Each radio takes turn transmitting
- GMRS radios also operate in “simplex” mode
 - GMRS radios have higher transmit power and will have greater range
 - MURS handheld radio - 2 watts max, ≈0.5 mile range
 - GMRS handheld radio - typically 5 watts, ≈2 mile range
 - GMRS mobile radio - 20 to 50 watts max, ≈5+ mile range

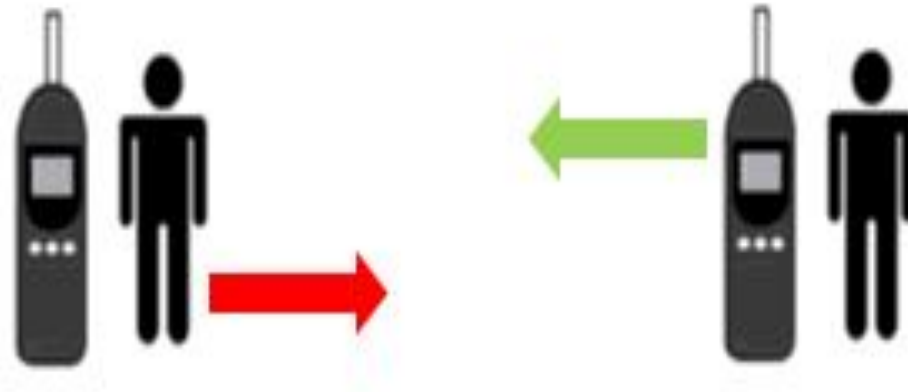
Repeaters - Another way GMRS can have even greater range

- A GMRS repeater is a system which can extend radio range
 - Repeater receives the radio signal on one channel and
 - Transmits the same radio signal on another channel
 - A repeater is usually mounted at a higher elevation and the transmitter has higher power (up to 50 watts)
 - This allows radios using the repeater have a greater range
- A GMRS handheld radio has a range \approx 2 mile range
 - A handheld using a GMRS repeater has a range of \approx 10+ mile range
- MURS & FRS radios do not have repeater capability

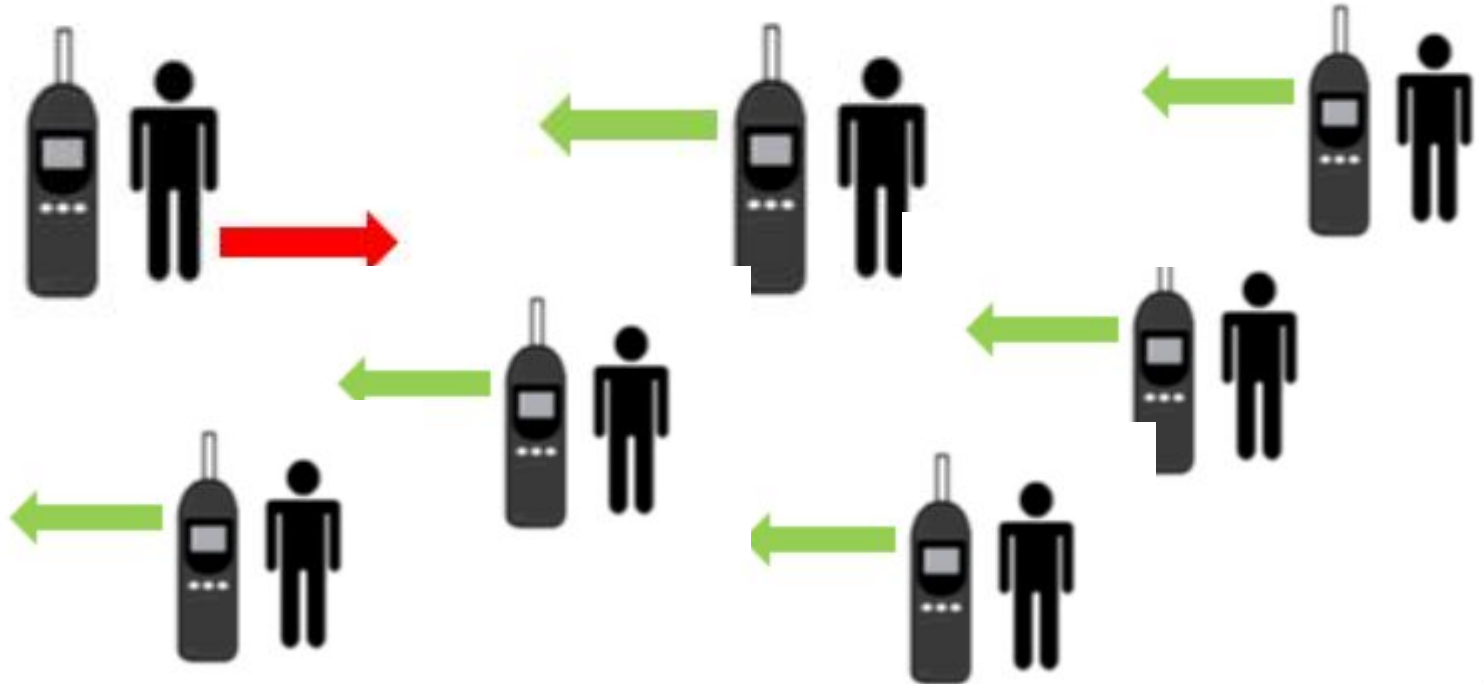
Line of Sight Propagation

- MURS, FRS & GMRS operate in Line of Sight Propagation
 - Same for Ham VHF & UHF radios
- Line of Sight means
 - Radio waves travel from transmitting antenna to receiving antenna in a straight line
 - Anything which blocks the Line of Sight will hurt signal range & quality

Line of Sight Simplex Communications

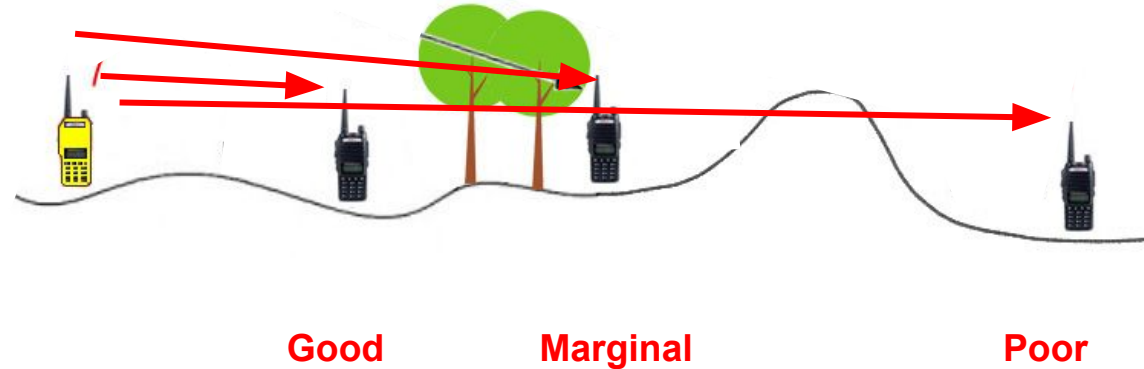


Simplex Communications Can be more than just 2 people



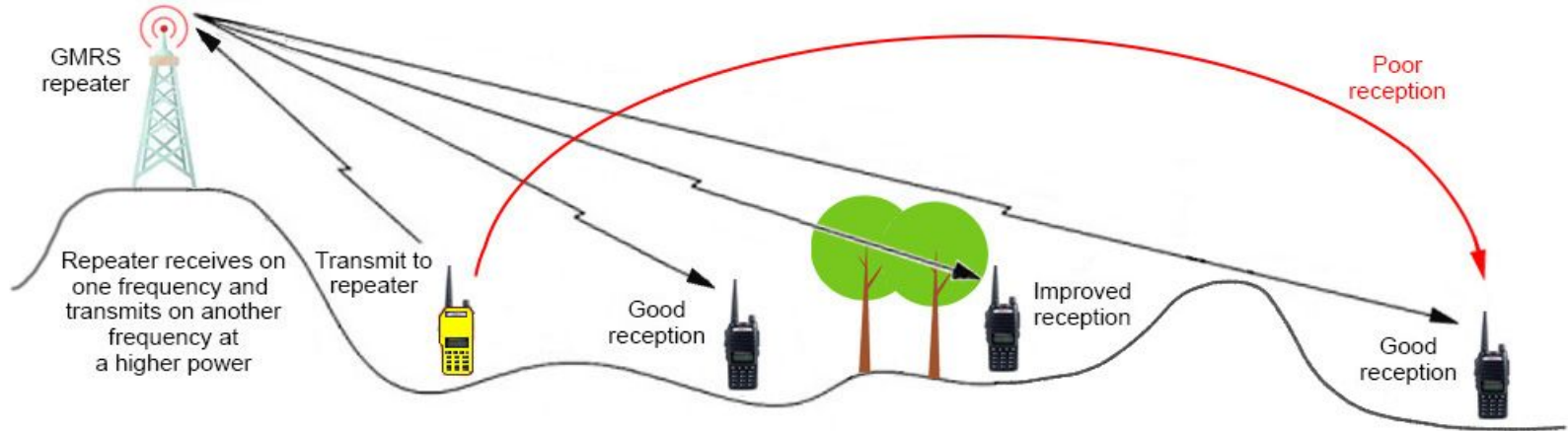
Limitations of Simplex

Anything that blocks line of sight -> limits radio range



(genoak.org)

Radio Repeater



- A GMRS repeater increases radio range
 - Higher elevation -> better line of sight
 - Repeater has higher transmit power

GMRS Radio Training

- Agenda
 - We have MURS, why do we need GMRS?
 - **GMRS Radio Training - Train the Trainers**
 - SJ CERT Radio Frequency Assignments & Repeaters
 - How to get your GMRS license

Radio Training - GMRS

- **GMRS = General Mobile Radio Service**
- Purpose of this section
 - Train you (Neighborhood Leaders) on use of the Wouxun KG-905G GMRS radio
 - Provide you with knowledge to train your neighbors & team members
 - Principles discussed here will apply to other radio models & types
- This builds upon the knowledge you have learned from the MURS Radio Training
- GMRS radio recommendations - popular with CERT
 - Wouxun KG-805G or KG-905G
 - Antenna upgrade: Nagoya NA-771G (SMA-F connector)

Wouxun - How to pronounce?

- How to pronounce
 - Wouxun -> Sounds like “Ocean”
 - Translation: Singing Communications

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Ōu xùn

Radio Training - GMRS (General Mobile Radio Service)

- This material is specific on the Wouxun KG-905G GMRS radio
 - GMRS = **General Mobile Radio Service**
 - A license is required (\$35/10 yrs, good for entire family)
 - For more details, refer to the Wouxun KG-905G manual (available on [buytwowayradios.com](https://www.buytwowayradios.com))
<https://www.buytwowayradios.com/wouxun-kg-905g.html>
- Wouxun KG-905G
 - Well built & rugged radio -> commercial grade
 - IP66 Waterproof (not submersible)
 - Transmitter power of 5 Watts
 - High capacity battery (2600mAh)
 - Can also directly charge battery with USB-C cable (without cradle)
 - Can be programmed from the radio front panel without a computer
 - Full programming is done with a computer
 - Radio has been programmed with local GMRS repeaters & channels
 - KG-905G is the big brother of the popular KG-805G

GMRS - Technical & Legal

- Some technical things about GMRS
 - There are 30 GMRS channels, including 8 repeater channels (≈462-467 MHz)
 - GMRS license is required to transmit
 - UHF (ultra high frequency) band
 - It is above the licensed ham 70cm band (420-450 MHz)
 - GMRS uses Frequency Modulation (FM)
 - GMRS operates in “line of sight” propagation
 - Transmitter power up to 50 watts
 - Handheld radios 5 watts (0.5 watt on some channels)
 - Mobile radios 20-50 watts (not allowed to use the above 0.5 watt channels)
 - The Wouxun KG-905G handheld radio has a removable antenna
 - Connecting to a vehicle or base station antenna will improve its range
 - FRS (Family Radio System) shares all the GMRS non-repeater channels
 - FRS does not required a license to use
 - Handheld radios only, limited to 0.5 or 2 watts
 - Do not have removable antennas (usually have short/stubby antennas)
 - Not repeater capable

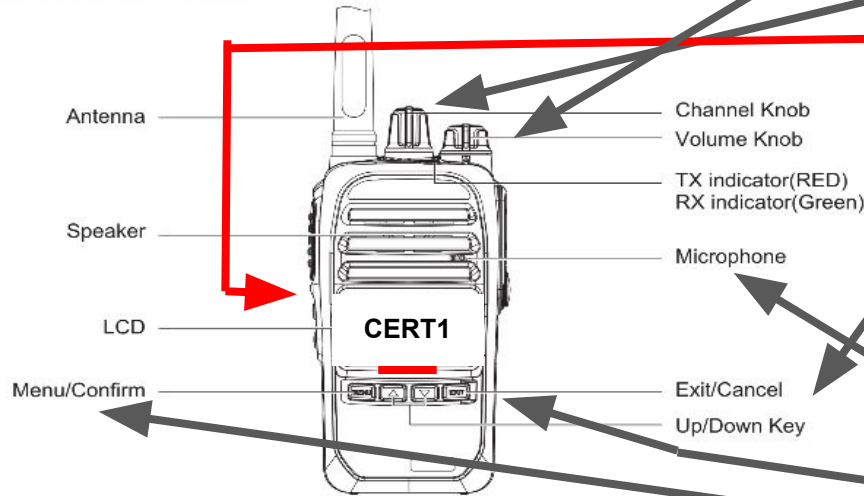
GMRS - Technical & Legal (cont.)

- For specific rules & regulations concerning use of GMRS radios
 - <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/general-mobile-radio-service-gmrs>
 - <https://www.ecfr.gov/current/title-47/chapter-I/subchapter-D/part-95/subpart-E>
 - Suggestion: You should read at least once

.

Wouxun KG-905G Front Panel

Getting Started Front Panel Guide



Volume Knob - **On/Off** & Volume (short knob)

How to change channel:

- Channel Knob (tall knob)
- **Up/Down Key**
- PF1 (Short Press) Channel **Group Up** (on Left Side of Radio)

If unable to change -> keypad is locked
Lock/Unlock - Press/Hold "Exit" (see display)
-> Lock after changing channel

Indicator Light

- Transmit (Tx) = **RED** (display "status" will also show bars)
- Receive (Rx) = **GREEN**

Microphone - Note microphone opening

Lock/Unlock - Press/Hold "Exit" (see display)
Do not press "Menu" unless you want to change Internal radio settings
If you accidentally press "Menu" -> press "Exit"

Wouxun KG-905G Right/Left Side

LEFT SIDE
PTT (Push to Talk)

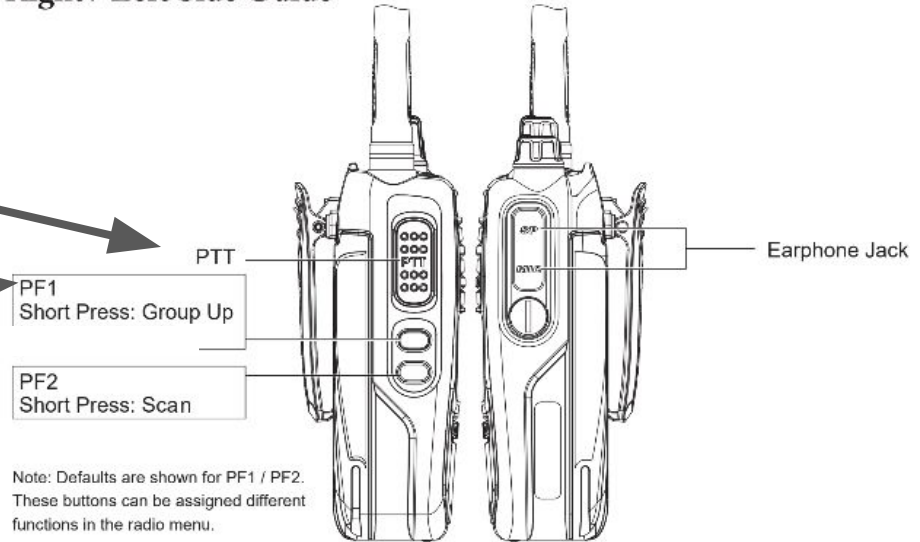
PF1 (Short Press)
Channel Group Up

Note: This radio does not have a
“Monitor or “Moni” function button

Getting Started

wouxun

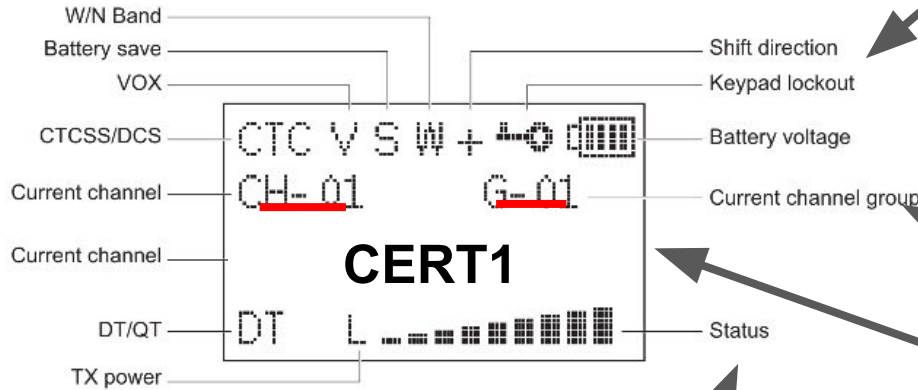
Right / Left Side Guide



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Wouxun KG-905G LCD Display

Getting Started Display Guide



Status will show bars when
You press PTT

Keypad Lockout:

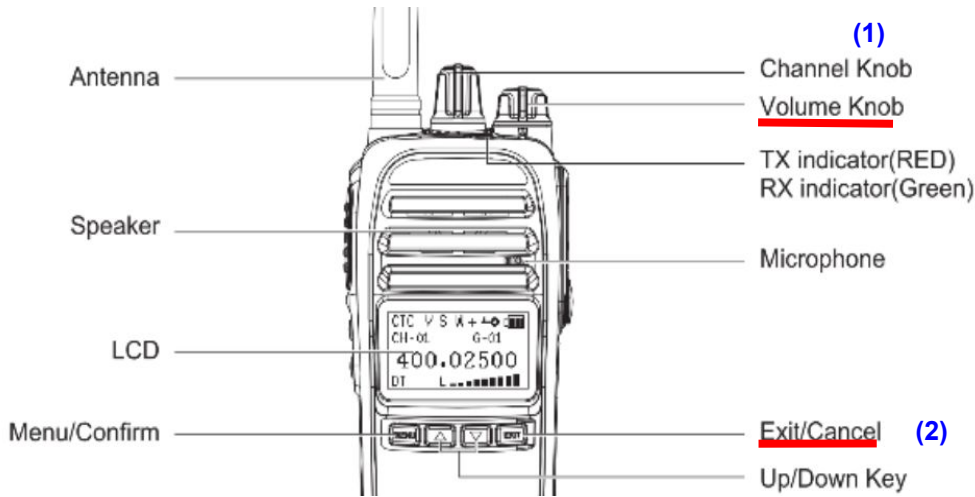
- When locked, you cannot change channel with Channel Knob & Up/Down Key (Also disables “Menu”)
- Press/Hold “Exit” to lock keypad
- Press/Hold “Exit” to unlock keypad

After changing channel, best to Lock Keypad (to avoid accidentally changing Channel & pressing “Menu”)

Current Channel & Group - Indicates channel **CH (Channel) & G (Group)**

Current Channel - Radio is programmed to show channel “NAME”
Examples: CERT1, CERT2, BANDIT, D5-19, TAC18

KG-905G Cheat Sheet



Volume Knob - **On/Off** & Volume

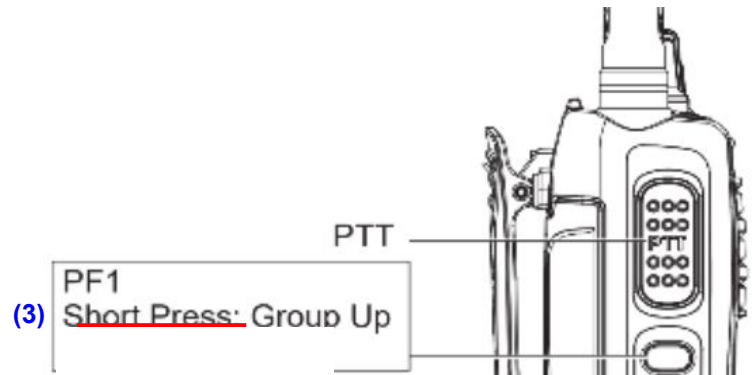
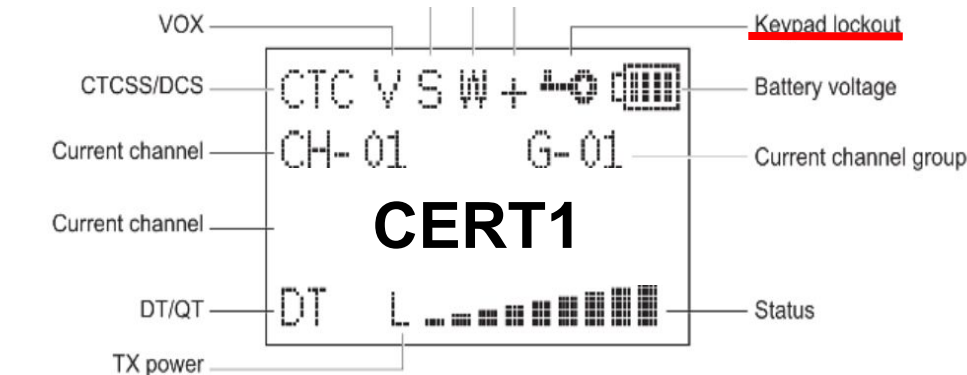
Lock / Unlock Keypad - Press/Hold "**Exit**" -> follow instructions on display (will show "key" if "**Keypad Lockout**")
Radio will auto-Lock Keypad after 30 sec.

Change Channel - (1) Channel Knob or (2) Up//Down Key, also PF1 (short press) on left side for (3) Group Up

This radio will show Current Channel = Name on display

If you accidentally press "Menu" & display shows internal settings -> Press "Exit"

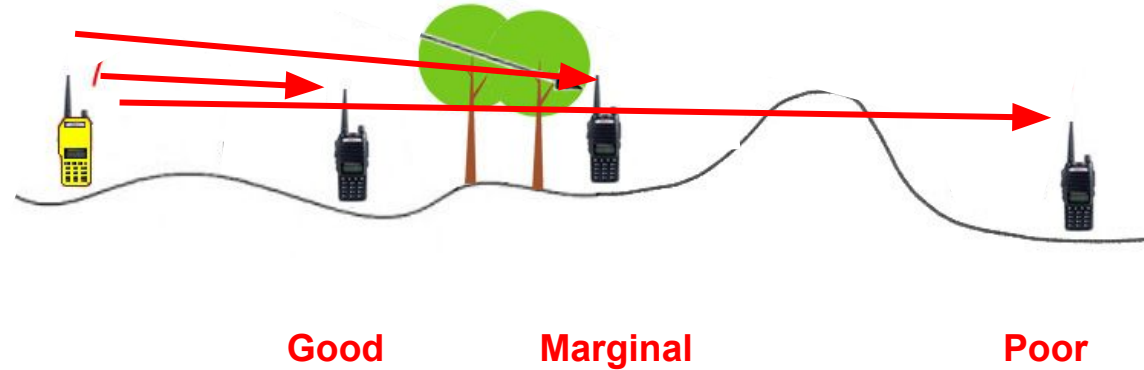
PTT - Big button on left side



How to get Maximum Radio Range

- Use the radio outdoors
- Do not use stubby/short antennas -> they provide less range than longer antennas
- Connecting your HT radio to a base station antenna & mounting it high will increase the range
- Keep the antenna vertical
- GMRS radios operate in “line of sight” propagation
 - Radio waves travel in straight line from transmitting antenna to receiving antenna
 - Changing your position & orientation may improve radio performance
 - Higher elevation
 - Clear view (no obstruction)
 - Caution: Be careful & safe when you move around for better reception/transmission
 - Be aware of your surroundings when you are moving to optimize your signal
 - Don't fall or walk into something

Limitations of Simplex



(genoak.org)

Battery Charging

- Charging with cradle
 - Plug AC adapter to charging cradle & plug adapter to 120vac
 - Turn off radio before inserting radio into charging cradle
 - Note indicator on cradle (Red = Charge & Green - Full)
 - When battery completes charging, don't leave radio on charger for extended period
- Can also charge by plugging USB-C cable directly to battery (on radio back) (cable not included with radio)
 - USB-C charging does not require cradle
 - Indicator on battery next to USB-C connector (Status = Red / Green)
 - Disconnect cable after charging
 - Can charge from car with USB (check your cable & vehicle USB)
- Warning: Exposed battery contacts on back of radio
 - Don't put radio in pocket, purse, backpack, etc. with coins & other conductive items

IP66 Waterproof

- Note: This radio is Waterproof, but not Submersible
- Wouxun KG-905G is rated IP66 Waterproof
 - IP = Ingress Protection for particles & liquids
 - First digit -> particle intrusion protection
 - Second digit -> liquid protection
 - Higher number = better protection
- This radio is waterproof:
 - Channel & Volume Knobs are “stiff”
 - May need to speak louder to the microphone
 - May need to increase speaker volume
 - To ensure waterproof protection: Check that the right side panel is tight & battery is securely attached to radio

Radio Programming

- Your KG-905G radio has been programmed & ready to go
 - Include local SJ CERT repeaters & channels
 - Programmed to auto-Lock Keypad (Press/Hold “Exit” to unlock)
- GMRS radios typically “may” require re-programming to update repeaters & channels
 - Near-term: We at sjncert.org can help
 - Long-term: You should have 2+ people local in your district to do programming
 - Scenario: We distribute an update file & your local team can re-program the radios (this will minimize radio downtime)
- We do not recommend a untrained beginner to change the programming
 - Skill to program updates is not difficult (more on next page)
 - ...Just need to be detail oriented & careful
 - A willing Ham or GMRS radio operator in your district is a good candidate to help (they usually know how to program radios)

Radio Programming cont.

- What you need to program KG-905G
 - Hardware
 - Windows* computer (laptop is best because it's more portable)
 - Programming cable (\$10-20)
 - Software
 - Wouxun KG-905G programming software (available from buytwowayradios.com) -> Official Wouxun software specific for KG-905G* (available for no charge)
 - This radio is not supported by CHIRP software
 - Training - We can help train
- Caution
 - If you want to learn programming on your own
 - Always copy your existing radio configuration before you attempt to make any changes (so you can go back to the previous working condition)
 - Changing radio settings can put your radio in a:
 - Non-compatible configuration (not be able to talk with your other radios)
 - In-operable mode (i.e. “bricked”) -> “usually” can be recovered if you re-load the previous working configuration
 - The internet has instructions & videos

Your GMRS Call Sign

- You will be assigned a GMRS Call Sign with your license
 - Call Sign format: 4 Letters & 3 Numbers -> A B C D 1 2 3
 - You should memorize your Call Sign
- FCC requirement: Announce your Call Sign when transmitting
 - Following a single transmission or series of transmissions, and
 - Every 15 minutes (if transmissions longer than 15 minutes)
- For CERT & emergency communications -> use Tactical Call Sign
 - With a descriptive & functional identification
 - Example: Command Post, Rover 1, Shelter 3, etc.
 - Use same Tactical Call Sign during the incident
 - Provides continuity with personnel or shift change

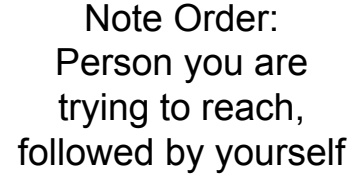
Best Practice: Announcing your Call Sign

- “Best Practice” is to clearly identify who is speaking
 - Important for clear & concise radio communications
 - Also to follow FCC rule (announce Call Sign at end of transmission)
- Using GMRS Call Sign only
 - Announce your Call Sign
 - At beginning of the transmission (ABCD123)
 - At end of transmission (Clear, ABCD123)
 - Every 15 minutes (when transmission >15 min.)
- Using Tactical Call Sign
 - Also use GMRS Call Sign at end of transmission per FCC
 - At beginning of transmission -> use Tactical (Rover 1)
 - At end of transmission -> use both Tactical & GMRS (Rover 1, ABCD123)
 - Every 15 minutes -> both Tactical & GMRS

Examples of Radio Exchanges

- Identify who you are trying to reach and identify yourself
- Acknowledge that you heard transmission
- Repeat back critical information (as necessary)

Note Order:
Person you are
trying to reach,
followed by yourself



- Rover 1
- Command Post
- Rover 1
- Command Post
- Rover 1

Command Post, (this is) Rover 1.
Rover 1, go ahead.
Bernal Shelter needs water bottles and blankets.
Roger, Rover 1. Shelter needs water and blankets.
Clear, Rover 1, ABCD123.

- Command Post
- Rover 1
- Command Post
- ...

All stations, (this is) Paseos Net Control, for health and welfare check.
Please respond with your status. Rover 1, status
Rover 1 location is 1234 Sea Court. I spell SIERRA ECHO ALPHA
Court. Continuing damage assessment.
Copy, Rover 1.
...

Examples of Radio Exchanges

- Rover 1 Rover 1 with emergency traffic.
- Command Post This is Paseos Net Control, go ahead.
- Rover 1 We have a downed power line at Avenida Rotella and Via Del Oro.
- Command Post Break. Any station in vicinity of Fire Station 28, advise Duty Officer of
downed power line. Report back when completed.
- Rover 2 Rover 2 with update.
- Command Post Paseos Net Control, go ahead.
- Rover 2 I am at Fire Station 28, informing Duty Officer about
downed power line.
- Command Post Roger, Rover 2.
-

- Identify who you are trying to reach and identify yourself
- Acknowledge that you heard transmission
- Repeat back critical information (as necessary)

GMRS Radio Training

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 - We have MURS, why do we need GMRS?
 - GMRS Radio Training - Train the Trainers
 - **SJ CERT Radio Frequency Assignments & Repeaters**
 - How to get your GMRS license

KG-905G Channel Assignments

STANDARD GMRS CHANNELS						SJ CERT GMRS CHANNELS								
CH	G	NAME	CH	G	NAME	CH	G	NAME	CH	G	NAME	CH	G	NAME
1	01	GMRS01	1	03	GMRS15	1	05	D1-15	1	06	TAC15	1	07	CERT1
2	01	GMRS02	2	03	GMRS16	2	05	D2-16	2	06	TAC16	2	07	CERT2
3	01	GMRS03	3	03	GMRS17	3	05	D3-17	3	06	TAC17	3	07	CERT3
4	01	GMRS04	4	03	GMRS18	4	05	D4-18	4	06	TAC18	4	07	BANDIT
5	01	GMRS05	5	03	GMRS19	5	05	D5-19	5	06	TAC19	5	07	ZELLO
6	01	GMRS06	6	03	GMRS20	6	05	D6-20	6	06	TAC20	Shown on your Radio Display CH = Channel No. G = Channel Group NAME = Channel Name		
7	01	GMRS07	7	03	GMRS21	7	05	D7-21	7	06	TAC21			
1	02	GMRS08	8	03	GMRS22	8	05	D8-22	8	06	TAC22			
2	02	GMRS09	1	04	RPT15	9	05	D9-15	10	06	CALL			
3	02	GMRS10	2	04	RPT16	10	05	D10-16	11	06	SJ OEM			
4	02	GMRS11	3	04	RPT17	13	06	W6UU	The 2 digit suffix in the Channel NAME refers to a specific frequency					
5	02	GMRS12	4	04	RPT18	14	06	WA2IBM						
6	02	GMRS13	5	04	RPT19									
7	02	GMRS14	6	04	RPT20									
			7	04	RPT21	For Channel details refer to San Jose CERT Radio Frequency Assignments (sjncert.org) http://sjncert.org/?page_id=799								
			8	04	RPT22									

Note: Your Wouxun KG-905G is programmed with these channels

G = 01-03 - Standard GMRS Simplex channels (no tones)

G = 04 -Standard GMRS Repeater channels (no tones)

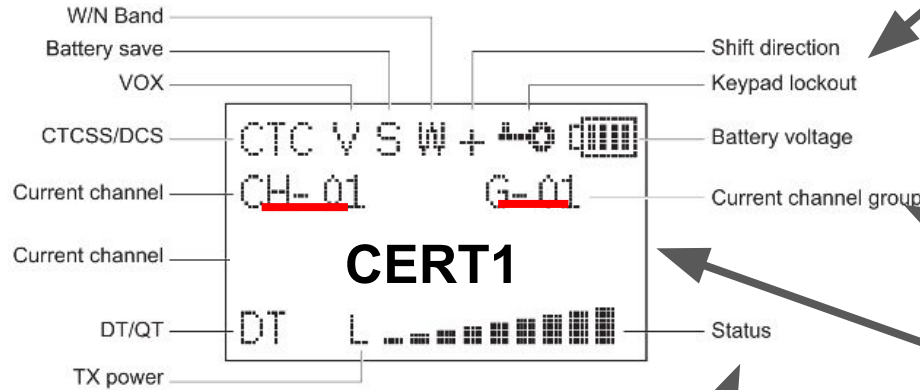
G = 05 - SJ DISTRICT Simplex (w/tones)

G = 06 - SJ TACTICAL, CALL & OEM Simplex (w/tones); Listen only Ham W6UU (SJRACES) & WA2IBM

G = 07 - SJ CERT repeaters

Wouxun KG-905G LCD Display

Getting Started Display Guide



Keypad Lockout:

- When locked, you cannot change channel with Channel Knob & Up/Down Key (Also disables “Menu”)
- Press/Hold “Exit” to lock keypad
- Press/Hold “Exit” to unlock keypad

After changing channel, best to Lock Keypad (to avoid accidentally changing Channel & pressing “Menu”)

Current Channel & Group - Indicates channel **CH (Channel) & G (Group)**

Current Channel - Radio is programmed to show channel “NAME”
Examples: CERT1, CERT2, BANDIT, D5-19, TAC18

Status will show bars when You press PTT

SJ CERT Radio Frequency Assignments

http://sjncert.org/?page_id=799



San Jose CERT Radio Frequency Assignments

Ch	Name	Receive Frequency	Transmit Frequency	Tone Mode	Encode rToneFreq	Decode cToneFreq	Encode DTCS Code	Decode DTCS Rx Code	DtCS Polarity	Cross Mode	Mode	Skip	Comment
1	AVPSN			TSQ	100.0	100.0			NM		NEM		Private Business Band Channel

- CERT Radio Frequency Assignments -> Living Document
 - Updated & maintained by J. Nourse
 - In alignment with Almaden Valley CERT assignments
 - Include
 - GMRS CERT repeaters
 - GMRS District channels (D1-D10)
 - GMRS Tactical channels
 - ...Plus SJ RACES/ham, AVPSN, MURS, etc.
 - Your GMRS radio will come programmed with the GMRS channels

San Jose CERT Simplex Channels

- DISTRICT Channels
 - For use within your District
 - Examples:
 - District 5 use District channel D05-19
 - District 10 use District channel D10-16
- TACTICAL Channels
 - For between Districts or backup/secondary for your District
 - Example
 - Use channel TAC18 for backup (or other TAC channels)
 - Use Tactical channel number different than your District channel number
 - Example (channel number = last 2 digits in the name)
 - You are in D5 -> You use District Channel D05-19
 - For Tactical channel: avoid TAC19 if you are using D05-19
 - Ok to use: D05-19 and TAC18 (or anything except TAC19)
 - *Why? The 2 digit suffix in the Channel NAME refers to a specific frequency -> want to avoid using the same frequency*
- Note: San Jose CERT Channels are set “with” PL Tones (see next page)

Standard GMRS Channels without PL Tones

- Channel Groups 01-04 on your KG-905
 - These are “standard” GMRS channels without Private Line (PL) tones
 - New radios from the factory are usually set up this way (radios which have not been programmed)
 - You will not be able to hear these radios on the District & Tactical channels
 - If you use a standard channel without tones, you will be able to communicate with them
 - About PL (Private Line) Tones
 - When a radio is set with a PL Tone, it can only receive from a transmitting radio with the same PL Tone
 - “Private” is a misnomer -> other radios can “hear” (if it is set without tones)
 - Do not say anything on the radio you consider personal & private

Weekly CERT GMRS Radio Check-ins

[Updated 8/6/23](#)

http://sjncert.org/?page_id=799

Repeater	Date/Time	Location	Notes	Comments
CERT2*	Tue. / 6:50 PM	Willow Glen	Backup	*J. Nourse, can also check in with VARA FM (data over ham radio)
CERT1*	Tue. / 7:00 PM	Mt. Pleasant	Backup	
CERT Bandit**	Tue. / 7:15 PM	Alum Rock	Primary	** Private repeaters, Owners allow CERT use; also available on Zello app -> need GMRS license to transmit on app Bandit = SJ CERT SmokeyBandit
Zello**	Sat. / 6:50 PM-radio 7:00 PM-app Updated 8/6/23	Santa Cruz Mtn	Backup	

Above sjncert.org link shows frequency details & Weekly CERT & Ham Check-In Nets

San Jose CERT Repeater Check-In

- How to check-in to a weekly CERT GMRS Repeater Net
 - Instructions for the beginner
 - On the net date & time, turn your radio on and set to the repeater channel
 - Monitor the net from the beginning (listen in early)
 - The Net Control Operator will announce specific instructions for check-in
 - Also: Listen to several other participants to learn how they check-in
 - When invited to check-in:
 - Press & hold your radio PTT and wait about 2 seconds
 - Speak slowly & clearly
 - Announce your Call Sign (phonetically) and your first name
 - Announce your city & neighborhood
 - Indicate if you have “traffic” or “no traffic”
 - Don't be shy, it takes some practices!
 - After you check-in, the Net Control Operator will acknowledge your check-in
 - If you are not acknowledged -> repeat your check-in

San Jose CERT Repeater Check-In

- How to check-in to a weekly CERT GMRS Repeater Net
 - Instructions for the beginner
 - On the net date & time, turn your radio on and set to the repeater channel
 - Monitor the net from the beginning (listen in early)
 - The Net Control Operator will announce specific instructions for check-in
 - Also: Listen to several other participants to learn how they check-in
 - When invited to check-in:
 - Press & hold your radio PTT and wait about 2 seconds
 - Speak slowly & clearly
 - Announce your Call Sign (phonetically) and your first name
 - Announce your city & neighborhood
 - Indicate if you have “traffic” or “no traffic”
 - Don't be shy, it takes some practices!
 - After you check-in, the Net Control Operator will acknowledge your check-in
 - If you are not acknowledged -> repeat your check-in

Why Participate in Repeater Check-In's

- Prepare for emergencies <- *This is what CERT is about*
- Practice your radio skills
- Make sure your radio & gear is working
- Know which repeaters you can reach
- Confirm repeaters are still working
- Learn new things
- Make connections & friendships in the CERT & radio EMCOMM community

Recap & Conclusion

- You have been introduced to the basics of GMRS radio
- Get your GMRS license
- You may not be proficient now -> you will if you PRACTICE, PRACTICE & PRACTICE
- Go out and train your team & neighbors
- Conduct radio range testing to know how far your radios will work
- Know what GMRS repeaters you can reach
- Practice -> Use the radios in your neighborhood & community events
- Schedule radio exercises -> keep practicing
- Thanks! Contact me if you have questions/comments: rmacwhy@gmail.com

GMRS Radio Training

- Agenda
 - We have MURS, why do we need GMRS?
 - GMRS Radio Training - Train the Trainers
 - SJ CERT Radio Frequency Assignments & Repeaters
 - **How to get your GMRS license**

How to Apply for a GMRS License

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D10 Los Paseos CERT
August 3, 2023

How to apply for a GMRS license

- GMRS license cost is \$35 and good for 10 years
 - No test is required to get a GMRS license
- You and your entire family can use the license
 - Any individual who holds an individual license may allow his or her immediate family members to operate his or her GMRS station or stations. Immediate family members are the licensee's spouse, children, grandchildren, stepchildren, parents, grandparents, stepparents, brothers, sisters, aunts, uncles, nieces, nephews, and in-laws.
- Here is a good youtube video on how to apply
Look for this youtube -> Applying for your GMRS license in 5 easy steps! LOL
Video by MedinaCountyTexasGMRS <https://youtu.be/meBYQ2WT46k>
- Warning about the above video -> FCC made changes to the license website after this video was made
 - Some of the links & website addresses are no longer correct
 - This package contains the correct links
 - This is still probably the best youtube on the subject

Tips for getting a GMRS license

- FCC website is NOT user friendly! (not like shopping on Amazon)
 - Sometime the FCC website goes down (try again later)
- Use only the official FCC website (it will say fcc.gov)
- You will need to provide personal information, including your SSN
- Age requirement to get a GMRS license: 18 years or older

- There are 5 steps to get a GMRS license
- How long will applying for a GMRS license take?
 - About 30-45 minutes
 - Including 15 minutes to wait for the Username confirmation email

Tips for getting a GMRS license

- Watch the youtube video first (about 15 minutes) <https://youtu.be/meBYQ2WT46k>
 - Do not start applying for the license yet!
 - Watching the video will let you know what to expect in when you start the application process (such as: how much info you need to provide)
 - The video is good, but some of the FCC links (in the video & on youtube) have changed (or can be confusing) -> the correct links are shown in this package
- When you are ready to apply for a GMRS license:
 - Print out this package and have it next to you when applying
 - I suggest you use on 2 computers -> pausing on each step
 - 1. Watch the video again on one computer (or tablet, etc.) -> pause at each setup (this is optional but highly recommended)
 - 2. Apply on a laptop or desktop (there is a lot of info to enter & a keyboard will make it easier), pause step by step
 - On this computer, have this document open -> you will use it to click on the FCC links

Navigating within FCC Applications

- When you are in the FCC applications
 - Where you have logged in with your Username or FRN
 - DO NOT USE browser **forward arrow** and **back arrow** (on the top)
 - **DO NOT USE:**
 - <- ->
 - USE the **buttons** within the FCC application (near the bottom)
 - **USE:**
 - **SUBMIT** and **GO BACK** buttons
 - **CONTINUE** button

Steps 1 & 2

- 1. Register Username
 - <https://apps.fcc.gov/cores/userLogin.do>
 - Look for -> Need a Username?
 - Register your email address & set your password
 - After you complete this step, you will get a confirmation email usually in about 15 min.
 - Look in your email account (if you don't see it, check your spam or other folders)
 - Click on the link in your email to confirm
- 2. Get FRN (FCC Registration Number)
 - <https://apps.fcc.gov/cores/userLogin.do>
 - Look for -> Username Login
 - Login with Username & Password
 - Look for -> Register new FRN
 - After you complete filling in info -> it will assign you a FRN
 - Write it down or take a picture of it -> you will need your FRN for the next step

Steps 3 & 4

- 3. Apply for GMRS license
 - <https://wireless2.fcc.gov/UlsEntry/licManager/login.jsp>
 - Look for -> Login & box for FRN
 - Login with FRN & password (same password as Username)
 - Look for -> Apply for new license
 - Select Service -> ZA - General Mobile Radio (GMRS) <- at the bottom of the list.
 - You may be directed to pay the \$35 GMRS license fee in this step
- 4. Pay license fee (Not required if you paid in Step 3)
 - <https://apps.fcc.gov/cores/userLogin.do>
 - Look for -> Username Login
 - Login with Username & Password
 - Look for -> Bills & Fees
 - GMRS license fee is \$35
- This completes the application process
 - Step 5 is to check on your application status (do in 2+ business days)

Step 5

- 5. Check for license status under your FRN
 - <https://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>
 - Do this 2+ business days after you applied & paid your \$35
 - Look for -> License Search
 - Select -> By FRN
 - Enter -> Your FRN (no password required)
 - If you see a Call Sign for Radio Service ZA (GMRS) -> you have been issued a GMRS license - Congrats!
 - Click on -> your Call Sign
 - Click on -> Reference Copy (near top)
 - This will download your GMRS Radio Station Authorization with your Call Sign
 - Keep it in a safe place
 - You can now start using a GMRS radio!
- A test is not required to get a GMRS license
 - People say: Applying for the license is the test!
 - ...If you get the license, you passed!

Backup Material

Radio Comparison: MURS vs. GMRS

- Your neighborhood will need at least one GMRS mobile radio (to reach Repeaters)
- GMRS radio is superior → Higher power, repeater capable & greater range
- License fee and higher radio cost may prevent widespread adoption in your neighborhood
- If you choose GMRS walkie-talkies only, will you be have enough people with radios?
- Option: Some GMRS with mostly MURS

	MURS	GMRS
License Requirement	License Free	License Required - \$35/10 yrs for individual+family No test required
Radio & Antenna Cost	Handheld \$20+ Telescopic antenna +\$5 Base antenna/cable +\$75	Handheld \$50+ Mobile \$120+ plus need Base antenna/cable +\$75
Transmit Power	Handheld 2W	Handheld 5W, Mobile 20-50W
Repeater Capable	No	Yes
Radio Range	0.5-0.75++ mile	Handheld 2 miles Mobile 10 miles w/repeater

Updated
8/7/23

CERT GMRS Repeater Locations

- GMRS Repeaters in San Jose for CERT Use
 - Bandit** - Alum Rock, East SJ (SJ CERT SmokeyBandit) - **Primary CERT repeater**
 - CERT1* - Mt Pleasant, East SJ - Backup
 - CERT2* - Willow Glen, West SJ - Backup
 - Zello** - Santa Cruz Mountains - Backup
 - CERT3 - NOT IN OPERATION YET, future City of SJ EOC repeater, at new Office of Emergency Management bldg -> under construction (Senter & Phelan)

Notes: *CERT1/2 setup by J. Nourse

**Private repeaters - Owners allow CERT use

**Also on Zello App, GMRS license still needed for transmitting on the app

Basic Radio Terms

Term

Affirmative

Negative

Radio check

Do you copy?

Loud and clear

Copy

Roger

Say again

Come again

Go ahead

Break

Stand-by

Over

Out

Clear

Meaning

Yes

No

How is my signal?

Can you hear me?

Your signal is good

Message Understood

Message Understood

Repeat your message again

Repeat your message again

I am ready to receive your message

Interrupting transmission with urgent matter

Your message received, but I am unable to reply
right away

My message is over, waiting for your reply

End of my transmission

End of my transmission

Avoid use of “coded” terms

Examples:

- *10-4 (Roger)*

- *QTH (What is your location?)*

NATO Phonetic Alphabet (Spelling Alphabet)

A	Alpha	H	Hotel	O	Oscar	V	Victor
B	Bravo	I	India	P	Papa	W	Whiskey
C	Charlie	J	Juliet	Q	Quebec	X	X-ray
D	Delta	K	Kilo	R	Romeo	Y	Yankee
E	Echo	L	Lima	S	Sierra	Z	Zulu
F	Foxtrot	M	Mike	T	Tango		
G	Golf	N	November	U	Uniform		

The NATO Phonetic Alphabet is used to spell words over the radio for clarity.

For example, the letters “B” (bee) and “P” (pee) can sound similar, especially if there is radio static. Using the phonetic alphabet you can say “Bravo” for “B” or “Papa” for “P” to avoid confusion.

Use the phonetic alphabet to spell out words clearly.

Example: You want to report there is an injured person at 123 “Park” Street -> spell “Park” as “Papa - Alpha - Romeo - Kilo” to avoid misunderstanding.