

# COMMUNICATE !

**Communication can be critical during a crisis. Phones may not work when most needed.**

Midland Radio Corporation makes a two-way radio capable of transmitting at the maximum power allowed for its class by the FCC. These consumer radios are inexpensive and do a good job reaching through our rough terrain. We found they transmitted over 8 miles on high power in our tests.\* We recommend these radios over other similar radios.

**The radios are available in sets from Amazon.com for about \$60 plus shipping.\*\* The set's model number is GXT900VP4. Manufacturer is Midland.**

Each set includes two radios, rechargeable batteries, two-station charger with wall and car adapters, and headphone / microphone sets.

## Radio Features:

- 5 watts maximum power = maximum range.\*
- Use *either* 4 AA batteries *or* the included rechargeable battery pack.
- Additional features: 22 channels, scan, NOAA weather, splash resistant, etc.



If you think this is a good idea, tell others. Copy or print this document and give it to your neighbors. The more radios in your area the more useful they are to communicate.

Email [bigsurcats@aol.com](mailto:bigsurcats@aol.com) if you have questions.

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\* Use of high-power channels requires an FCC license (\$85 for 5 years). One license required for each family. No license required for use of channels 8-14 (low power). There is a large fine for use of high-power channels without a license. We recommend that before using these channels you get a license, which is fast and easy to do over the Internet. Transmit distance depends upon terrain. On high power, we got 8 miles with almost line of sight, and over 2 miles with moderate obstruction by trees and terrain. Expect only a few hundred feet if both radios are in a canyon in dense woods. Will transmit over slight landforms, but not at all if a substantial landform is in the way. Low-power transmit distance should be less than half high-power transmit distance.

\*\* The radios were in stock on Amazon.com when we checked November 7, 2008. They are currently on backorder at the factory, but Midland says they will start receiving shipments the week of November 9, so they should be back in stock soon if Amazon runs out. You can also find them on other websites.

## Suggested use of Midland GXT900 FRS/GMRS radios for emergency communications.

Ver5 12/2/08

### General notes:

- If phones are working, always use 911 to report emergencies.
- These suggestions are just that, suggestions. Only FCC rules must be followed when using these radios.
- No license is required to use channels 8 through 14.
- Obtain a General Mobile Radio Service (GMRS) license before transmitting on channels other than 8 through 14. Fastest process is online. This is a good page to start with for licensing <http://wireless.fcc.gov/uls/index.htm?job=home>. If you want more instructions start on [http://wireless.fcc.gov/uls/index.htm?job=about\\_getting\\_started&page=1#d36e21](http://wireless.fcc.gov/uls/index.htm?job=about_getting_started&page=1#d36e21). License cost is \$85 for 5 years. One license required per family. Worth the cost to avoid a \$10,000 fine. Complete forms 605 for license and 159 for on-line payment.
- Keep your radios charged and ready for use. Use them for recreational and other uses so you are familiar with how to use them. Avoid using channels 14 or 15 (see why on next page - there are lots of other channels).
- If non-emergency use, switch to another channel if you hear others using the channel you are on (good radio etiquette).
- Purchase lots of AA alkaline batteries, or rechargeable AA batteries and a quick charger with wall and car adaptors (don't try to charge alkalines!). The battery packs that come with the radios take many hours to charge and the AA rechargeables can be charged much faster. No good batteries = no radio.
- Always keep transmissions as short as possible (good radio etiquette, and saves your batteries as transmitting uses much more power). Read more about radio etiquette on the Internet (here's one page, <http://www.qso.com/satern91710/etique.htm>).
- Channels 1 through 22 on this radio will likely be compatible with the same channel on other FRS/GMRS radios, but not necessarily. However, these radios appear to transmit farther than other FRS/GMRS radios, so people with other radios may hear you without you hearing them.
- Below are frequencies used for Midland GXT900 channels 1 through 22. If you have another manufacturer's FRS/GMRS radio and know the frequencies it uses for channels, you can use this table to check which channel to set your radio on to communicate with a GXT900. Channels 23 through 42 (not shown) should not be used, especially in an emergency, as they merely use one of the frequencies for channels 1 through 22 with a factory-default "privacy code" set (see notes 9 and 10 on next page.)

### GMRS/FRS FREQUENCY CHART (MHz)

CH. No	CH. Freq.	CH. No	CH. Freq.	CH. No	CH. Freq.
1	462.5625	9	467.5875	17	462.6000
2	462.5875	10	467.6125	18	462.6250
3	462.6125	11	467.6375	19	462.6500
4	462.6375	12	467.6625	20	462.6750
5	462.6625	13	467.6875	21	462.7000
6	462.6875	14	467.7125	22	462.7250
7	462.7125	15	462.5500		
8	467.5625	16	462.5750		

\* Channels 8~14 are low-power FRS license free channels

## Emergency use notes:

1. Until you are familiar with the radios use only the default settings, except as directed below. Always follow 9, 10 and 11 below.
2. Turn radio on and set it to channel 15 if you have a GMRS license, or to channel 14 if you have no license. To set the channel press menu button once, then use the up or down buttons (▼ ▲) to change the channel number to the one you want, then press the Push To Talk (PTT) button on side of radio to save the setting (or just wait about 5 seconds and the setting will be saved automatically).
3. Set the two-channel scan feature to listen to channels 14 and 15. The first channel that will be scanned is the one you set the radio to in number 2 above. To set the second channel that will scan, press the menu button 11 times slowly, or until you see the  $\frac{RX}{TX}$  sign, then use the up or down buttons to change the number to the number of the second channel you want to scan (if you set your radio to use channel 14, set the second channel to 15, and vice versa). Then quickly press the PTT button on the side of the radio (this locks in settings after you have made them). Wait a few seconds and your radio should begin scanning these two channels (14 and 15). Note that no license is needed to listen to channel 15. If you transmit or receive on a channel, the radio will lock on that channel for about 10 seconds and will then resume scanning both channels. If you press the mon/scan button the two-channel scan feature will turn off, and the radio will stop scanning the second channel and will work only on the first channel until you go back through the process of setting it to scan the second channel.
4. Press the PTT button on the side of the radio and ask if anyone is listening, then release the PTT button and listen (with the volume turned up).
5. Due to the chaotic nature of emergencies, you and others will have to self-organize a communication system for your area. For example, once communicating, you can arrange for certain times of day to check in and talk with each other, or to talk on different channels (however, please see number 10 below). You may be able to arrange for communication with the outside world when needed if one of you can contact an emergency-service responder who has a public service radio.
6. You can relay messages over ridges into another canyon if you have a "human repeater" on a ridge top (a person on the ridge who can communicate with people in more than one canyon, or on another ridge).
7. You can transmit over long distances if you have clear line of sight to the other location. In high-power tests, we got over 8 miles with almost line of sight and over 2 miles with moderate terrain and trees in the way. Expect only a few hundred feet if both radios are in a canyon in dense woods. The radios will transmit over slight landforms, but will not communicate at all if a substantial landform is in the way. Elevation is your friend when it comes to distance. Low-power transmit distance should be less than half high-power transmit distance.
8. The radios are only moderately splash resistant. Use them inside a zip-lock bag if it is raining or otherwise keep them dry.
9. **DO NOT** use group mode or privacy codes. Privacy codes do not make your transmissions private. They make it so you cannot hear others – but others can hear you. If you set a privacy code you may be talking over others without knowing it, interfering with important communications. By default, no group or privacy codes are set. Leave them off.
10. **DO NOT** use channels 23 through 42 (or any channel other than 1 through 22). These are NOT separate channels, but are one of the channels 1 through 22 with a factory-default privacy code set. You may interfere with critical communications without knowing.
11. **DO NOT** use VOX (voice activated transmission). This will result in unwanted transmissions that needlessly interrupt others. VOX is turned off by default. Leave it off.
12. **DO** have the "roger beep" on (lets others know when you are done talking so no need to say "over"). See owner manual page 16.
13. Following these practices, you should hear all transmissions within range on channels 14 and 15, and you and your neighbors can organize a communication system for your area, including switching to other channels as appropriate.
14. To listen to NOAA weather radio see owner manual pages 17-18 (received in few locations in Big Sur as of 12/2/08).

# **RADIO ETIQUETTE for two-way radios**

[Adapted from the website of the National Interagency Fire Center]

Radio use is a command and control tool. It is used to pass information across great distances and make coordination of resources possible in a way that smoke signals, mirrors, runners, and other ancient means of communications just can't begin to match. Like any other tool, it can be misused. Here are a few ideas that will help you to avoid becoming a source of apoplexy for others.

Allow a split second before beginning a transmission. Be brief and to the point, keep the channel open for others to use. Speak directly and clearly into the mic 2-3 inches away from your mouth. Use the name of the person you are contacting (first) and then identify yourself: "Dave - Mary. Acknowledge that you have heard the communication: "Go ahead."

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## **Radio Language**

1. **Use Plain English aka "Clear Text"**
  - Do not use 10 codes – not familiar to all firefighters and can differ between jurisdictions.
2. **Use location identifiers or functional title**
  - Location examples – Division B, Drop Point 2, Staging Area, Helibase
  - Functional titles – Taskforce Leader, Medic, Operations
3. **Use Phonetic Alphabet**
  - Enunciation tends to be lost on the radio and individual letters can be miss-communicated over the radio.
  - Using the phonetic alphabet will reduce communication mistakes

## Phonetic Alphabet

Letter	Phonetic	Letter	Phonetic	Letter	Phonetic
A	Adam	M	Mary	Y	Young
B	Boy	N	Nora	Z	Zebra
C	Charles	O	Ocean	0	Zero
D	David	P	Paul	1	One
E	Edward	Q	Queen	2	Two
F	Frank	R	Robert	3	Three
G	George	S	Sam	4	Four
H	Henry	T	Tom	5	Five
I	Ida	U	Union	6	Six
J	John	V	Victor	7	Seven
K	King	W	William	8	Eight
L	Lincoln	X	X-ray	9	Niner

#### 4. Use standard expressions

- Standard expressions reduce the amount of time transmitting on frequencies and reduces confusion

<u>Expression</u>	<u>Meaning</u>
Go ahead	Pass your message
Copy	Message received and understood
Repeat	Retransmit message
Standby	Message acknowledged but I am unable to reply or deal with it at this time.
Affirmative	Yes
Negative	No
Do You Copy	Do you understand, please acknowledge
En Route	Resources heading to incident
Unreadable	Used when signal received is unclear or not understood
Disregard	Don't pay attention to the last radio traffic

#### 5. Don't Swear

## Radio Efficiency

- 1. Know what you want to say before you key the radio**
  - Leave out the Ahs and Ohs
  - Think first then speak
- 2. Keep it short and simple**
  - Try not to pack 5 seconds worth of information into 30 seconds
  - Don't use long/big words when a short one will do
  - **Bad:**  
Ah Taskforce Smith this is, Jones, Ah yeah ah roger that ah Taskforce - got a ah solid copy on your last ah transmission about that ah geographical location that we're ah supposed to be moving towards to ah, rendezvous ah, that is, ah, meet up with the ah, other Crew.  
Over
  - **Good:**  
Net control this is Jones  
Copy  
Short transmissions extends battery life
- 3. Pause your transmission every now and then**
  - Ensure that the person on the other end is copying your transmission
  - Allows others to break in with more important information without walking over your transmission
- 4. Remember the whole world is listening**
  - Anyone with a scanner or another radio can listen to your transmission
  - If you don't want others to hear it, don't say it
- 5. Speak clearly, don't shout**
  - Shouting causes distortion and makes you hard to understand
  - Remain calm at all times, don't rush your message
  - Speaking loudly does not increase your radio range
- 6. Don't read everything back**
  - It doubles the air time
  - Use "Repeat" for the stuff you didn't copy
  - Instead say "Copy" and stand by for the next transmission
- 7. Transmissions should include unit identifiers**
  - To be sure you're getting through to the right person
  - **Here's a sample:**

"Command Post - Partington Team Brown"

*(PTB wants to talk to the Command Post and is letting them know).*

"Go Ahead"

*(CP is telling Partington Team Brown that they're ready to listen).*

They might have said

"Standby"

*(The CP is busy and will call Team Brown back).*

"Partington Team Brown - Command Post"

*(OK, situation dealt with, what's on your mind?)*

"We need some buckets and Johnson will be the contact for them"

*(Pause to see, did you get that, Command Post?)*

"Copy"

*(OK Team Brown, ready for more info)*

- This is a simple way to reduce air time used by eliminating points of confusion because someone misunderstood the message

8. **Always remain calm and speak clearly**

- This increases reaction time and allows for good, safe decisions