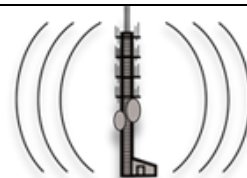


# MOBILE RELAY



A S S O C I A T E S

dba Raycom

## Instructions for Operating My Digital Trunked Mobile Radio on the MRA Network With Simplex

Trunked digital repeater radios operating on a network are a most sophisticated form of repeater operation available today. Radios talk direct to the repeater and the repeater transmits to the other radio users. Trunked repeater systems contain multiple repeaters at each of the many locations within the network and your radio can automatically select the use any of them without user intervention. If the repeater infrastructure fails, no one can speak to anyone else through the system that failed because all transmissions are repeated by the repeater and there isn't any direct communications from one user radio to another user radio.

**The following describes the use of a mobile (vehicle mounted) radio. To operate the radio:**

1. Press and hold for one second the ON-OFF button in the upper left corner of the radio to turn on the radio. Use the VOLUME UP and the VOLUME DOWN arrow buttons to the left of the LCD display adjust the receive volume control to be the appropriate volume for your ambient noise condition. The volume has no effect on transmitting.
2. Press the TALK GROUP UP or TALK GROUP DOWN buttons to the right of the LCD display to the proper talk group for operation if you have more than one talk group in the radio. Some radios are programmed to select talk groups with the zone up and zone down buttons which can be programmed to the left and right arrows below the display.
3. The radio logs into the network by finding a nearby control channel at the site that covers the area in which you are located. It then sends a login request to the network. If the network recognizes your radio as valid, it sends a signal to the radio acknowledging the login. If your radio is not authorized, the network will send a rejection at which time you will receive a message that the login failed. On most digital radios, the site number for which your radio has accessed is displayed at the top left corner of the LCD display. If the network fails, your radios will not function at all. If a site in the repeater network fails, you will lose the coverage unique to that repeater site. If a repeater fails at a site, it will result in a reduction in traffic capacity, thus increasing the chance that you will receive a busy signal when you attempt to talk.
4. Press and hold the Push-To-Talk (PTT) button on the left side of the mobile microphone. The radio will briefly transmit a request to talk to the repeater. The repeater will respond with either a denial (low series of beeps) otherwise known as a "busy signal" which indicated that all channels are in use or it will respond with a channel assignment at which time your radio will give you a proceed tone (triple high-pitched beep). This process can take up to 10 seconds in some situations. Under most circumstances, the "proceed" tone will be received within a second. Speak in a normal voice from about 1 inch from the microphone. Release the PTT button to hear a response from the party you have called. Do not yell or scream as it will only degrade your intelligibility.
5. If you are receiving a transmission from someone in your talk group, your radio is inhibited from transmitting. When you press the PTT button, nothing will happen until the transmission from the other

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user ceases at which time your radio will start transmitting and you will receive a “proceed” (triple high-pitched beep) tone.

6. The radio will normally display your group name. When you receive a call from another member of your group, the radio will display the “Caller ID” of the calling radio to assist you to identify the calling party if they do not identify themselves. The “Caller ID” will time out after 5-30 seconds depending upon the setting within your radio programming and return to your group name.
7. All user radios selected on the same talk group that are turned on and in range of the trunked repeater system will switch to the same repeater in the trunked repeater system as your radio for the period of the transmission, provided they are registered onto the same site. They will then revert to the control channel after the transmission is finished. If they are registered on a different site, all the radios from your talk group will switch to the same channel on that site (which will be different than the channel on your site) to complete the call. The two sites are connected to each other, so anything said on one site is repeated on the other site. If there are more than two sites having radios registered from the same talk group, then all the sites are connected to each other that have units registered on the same talk group. Therefore, no matter how your fleet of radios on a given talk group spread out over the network, they will be connected to each other. No manual user intervention is required to switch sites, login or register on the network.
8. With digital trunked repeater operation, all transmissions go through the repeater. Therefore, when you talk, all the users (that are in range of the repeater) will hear your transmission with the same clarity except for radios in a marginal signal area. If you are not in range of the repeater, you will not be able to transmit as evidenced by a steady tone when you attempt to transmit. If you have a good signal into the repeater, everyone will hear you clearly except for radios in a marginal signal area. As the signal degrades, eventually the signal will be too weak to provide reliable communications and the repeater may stop retransmitting your signal (otherwise known as dropping out of the repeater). Typical range is dependent upon the location of the repeaters in the network and how high the repeater antenna is located above ground. Consult our coverage maps to view the predicted coverage area.
9. When located in an area where the network coverage is marginal or non-existent, you can change the channel on the radio using the channel select buttons to the right of the display or the left / right arrows below the display of the radio to a simplex or “tactical” channel which bypasses the network and talks directly radio to radio. When changing the channel, the radio may indicate “locked” when you attempt to change the channel in which case you need to press the orange button to unlock the channel select switches. If the feature is programmed into the radio, pressing the orange button toggles between locked and unlocked. Keeping the channel locked prevents accidentally changing the channel when it is not intended.
10. If you are on the simplex channel, each radio sends out its signal and the signal travels as far as it can directly to the other radios without the help from the repeater network. Therefore, when you talk, some people will hear it and some will not hear you, depending upon where they are located. Typically, the people closer to you will hear you and the people further away may or may not hear you depending upon the distance and what obstructions are between you and them. As the signal continues to degrade, the signal may start to cut out at times and eventually the radio will no longer communicate. You will not get static in the reception of the radio signal, but you may get a digital / mechanical sound before it completely fails to communicate. The typical range with portable radios is about 0.6 mile in the city and a mobile radio will be about 6 miles in the city. The typical range with a portable radio in rural areas is about 2.4 miles in the countryside and about 18 miles for a mobile radio in the same area. *Digital radios typically get about 20% better range than an analog radio with everything else being equal.*
11. When using the simplex channel, you will not be able to receive any calls from the network. You cannot scan between the network and a simplex channel. Therefore, you should let the office know that you are going onto the simplex channel and will not be able to be reached before you switch back to the repeater network from the simplex channel.

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**Some people operate their radio while the vehicle ignition is turned off. The following information applies to the vehicle battery for mobile (vehicle mounted) radios:**

1. Vehicle batteries that are very low can cause the radio to “reboot” whenever you press the PTT button or reboot continuously. Some radios will act very strangely and do things abnormally until the battery is charged or replaced. If this happens, you will need to start the ignition on your vehicle to properly operate the radio.
2. When you are finished using the radio, turn it off unless you have the radio hooked to the ignition so that it turns itself off after the prescribed time which can be an extra cost option for most installations.
3. Transmitting takes the most power from the battery by a significant margin, so if you do not talk often, your battery will last significantly longer. Conversely, if you talk often, your battery will discharge more quickly.
4. If the radio has a HI / LOW power button, switching the radio to low power will extend the battery life of your vehicle battery when operating the radio with the ignition turned off, but it will reduce the ability of the radio to access the network with your transmissions. If you can reach the network with a good signal on low power, the higher power does nothing to help.
5. If your vehicle battery is low enough to have problems with the radio, there is a good chance that your vehicle will not start unless you have a dual battery system.

**The following are tips for getting the most from your mobile radio:**

1. Keep the radio antenna on the vehicle in a vertical position to maximize the radio reception. The radio signal is vertically polarized, so a vertical antenna will perform better.
2. If the signal quality is poor as indicated on the signal strength indicator, try moving the vehicle a few inches to a few feet for better quality signal.
3. Signal quality maps indicate the signal strength outside the building. The signal will be considerably weaker inside a structure, especially underground.
4. If inside a building such as a parking structure, try moving to a window, moving to a higher floor or exiting the building for better reception.
5. Do not bend the antenna to loop it so that it is shorter. This will have adverse effect to the range of the radio and can damage the radio.
6. Shorter antennas are available for most mobile installations, but they will often compromise the range of the radio.

**The following are tips for passing messages using any radio:**

1. Keep transmissions brief and to the point so everyone can use the radio.
2. Call the individual to whom you wish to speak and wait for their acknowledgement before you state the message. Talking to someone who is not listening only delays getting your message to its intended destination.
3. Break long messages into smaller “chunks” and verify the listener’s receipt of the message portion before proceeding with the next part of the message.
4. Clearly identify the person to whom you are calling as well as yourself or your location/job. i.e. “Jane Doe to John Doe” or “Unit 3 to base” or “Dispatch to Station 3”.
5. After receiving a message, acknowledge receipt of the message by saying OK, 10-4, “got it”, etc.. so that they know that you properly received the message.