Simplex Communications Radio Project May, 2024

The purpose of this project is to explore the possibilities of simplex communications using portable, mobile and base GMRS radio stations to the extent of their respective limitations.

The overall plan is to first educate all interested operators about simplex communications and how it differs from repeater use (AKA Half-duplex) communications. Additionally, educate about equipment accommodations which should be made in preparation for a simplex call-out drill. Then, share some specific details which will be needed for operators to prepare for a series of simplex call-out drills to be performed in the near future. Thirdly, schedule and execute these call-out drills in an attempt to make simplex contact with local operators and record the results. Thus, learning which operators, if any, each of us may be able to make simplex contact with.

In voice communications, there are 3 basic types that are used today. The first being simplex, which is 1 voice transceiver to another without a repeater. One good example of this is in the common use of walkie-talkies over a small area between multiple individuals. The 2nd is half-duplex, which is voice comms going in 2 directions, but one operator at a time as in the case of a GMRS repeater system. The third type is full duplex, which is what we best know from telephones and cell phones where we can have 2 or more voice comms being spoken and heard simultaneously.

Simplex comms are not private, but are local only. Your station will be limited in simplex range, based on several factors. Leaving out the possibility of a band opening (tropospheric ducting) for these purposes, the most important factor will be the station's antenna/feed line set and related variables. In order to maximize your simplex range and potential for contacts, an omnidirectional antenna would be optimal. This ensures that your station will have a measurable radius for it's range of coverage, rather than a much more focused pattern as in the case of a directional antenna. For those who are only able to use a directional antenna, being aware of the limitations of this antenna design, one may decide to get creative and ambitious as they rotate their antenna mast in some systematic way to maximize contacts despite the disadvantage.

As is the case for any station, the SWR should be checked and in a safe range on the targeted frequency. Additionally, care should be taken that coax/feed line used and ALL OTHER CONNECTORS/COMPONENTS between antenna and radio are minimized and of low-loss quality, thus optimizing station performance. When choosing an antenna for your station, the 2 biggest considerations are band compatibility and db gain. If you choose an antenna that is tuned to the frequency you will most often transmit on, omni-directional and has the most db gain you can afford, you will have optimized your station to the best of your ability. Don't forget the height, though. Your antenna should always be mounted as high as possible (and legal and safe). Special considerations need to be made for cases with feed lines measuring more than 100 feet and towers measuring 200 feet plus. By nature, handheld radios will have the shortest range of all station types.

After considering all of the available GMRS frequencies, for the purposes of this project, the Channel 7, Frequency 462.7125 will be used until further notice. This channel has a maximum permitted power level of 5 watts, limited by the FCC. Although higher wattage transmissions can possibly penetrate more obstructions, thus carrying an RF signal further, 5 watts is sufficient for the purposes of this project. Once optimized, any GMRS mobile or base

station should be expected to reach from 5-50 miles away. Even hand held radios should reach about 1-5 miles under normal conditions. One big reason why channel 7 was chosen instead of one of the 50 watt channels is because of the high possibility of interference from repeaters. All 50 watt channels on GMRS are part of designated repeater frequency sets which are likely to be used by a local repeater which could cause complications and confusion. It is possible, of course, that some may receive local interference while listening to this channel 7. It may even be unusable to some because of too much interference. If this is your experience, please report your findings on the following net for group consideration. It may be necessary to use a different frequency in these cases.

Channel 7 should be programmed into a radio without any off-set or tone. The TX & RX frequencies should match. There should be no PL tones, squelch tones, etc. used on TX or RX for the purposes of this exercise. Ensure that your radio has been programmed accordingly, prior to the start of the call-out drill.

You will be given a day of the week and time of day to potentially meet other neighboring radio operators on the air. At this time, be cognizant of other operators who may also be calling out with you, but also be assertive and persistent in your calling. Make short calls with nothing more than your call sign and first name. This will make it simple for a listener to focus on, and it will minimize the chances of missing a call while making a call. Leave a minimum of 10 seconds between calls for response and fellow callers. Respond to whatever you hear with a brief, but honest report and greeting. Record the call sign and name of any operators you hear during this time. Record even partially received information. Confirm info as able and move on to more calling and listening until drill is over. Save records for follow-up net and share results with others on net for further education and enjoyment. Also keep these records for your own reference in a time of odd circumstances. Or even consider forming your own local simplex club with nets and such! And, of course, in the event of a repeater being down or even an emergency, you and your simplex buddies are better prepared to keep in touch than the average Joe Shmoe.

When?	**Where?**	**How?**	**Why?**	**What?**
Saturdays	Channel 7 GMRS	No off-set!	Education	Simplex Call-Out
6;00 PM CST- 6;15 PM CST	462.7125	No tones!	Preparation	Texas GMRS

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