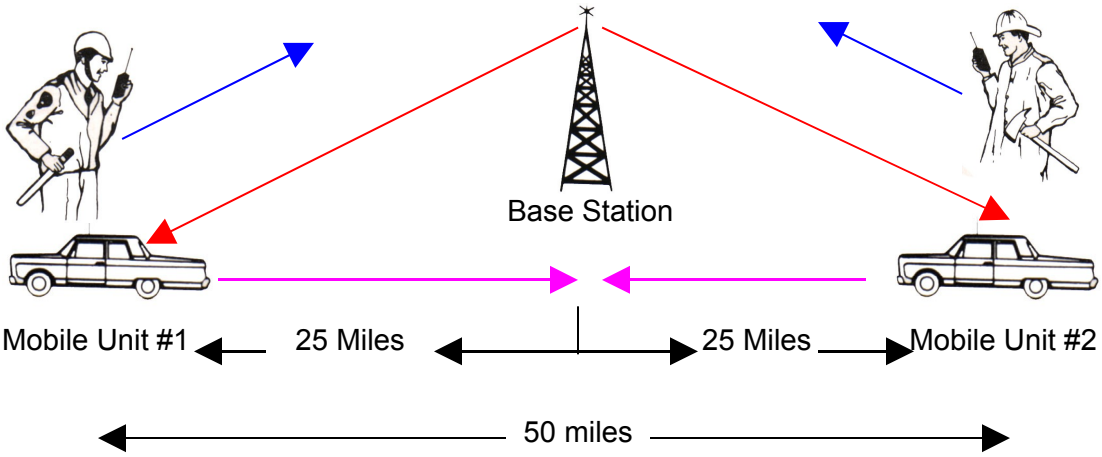
Range Extender!

Hardly a day goes by that we don't get a call from someone asking if we have an affordable means of filling in coverage to a marginal reception area or if we can get handheld radios to perform as well as mobiles. The fact is that we CAN solve both of these problems with a single product. It's called the Liberty Repeater!

Before explaining the features and benefits of the Liberty Repeater, let us demonstrate the need for a repeater by sharing a few examples. The most common need is to extend range between mobile or handheld radios. As you will note from the diagram below, a typical *base station* may have a range of 15 – 25 miles when talking to a mobile. In this example, we see a centrally located base station capable of talking to mobiles in opposite directions. The distance between these mobiles could be as much as 50 miles – far beyond the communications capability of one mobile talking directly to another.



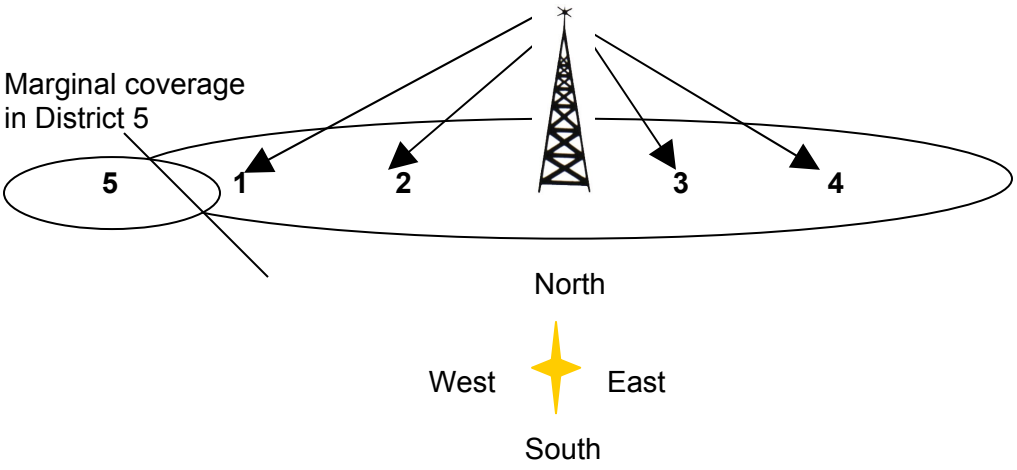
Since the typical range for direct communications between one mobile and another is 5 to 10 miles, it is obvious that these two mobiles cannot talk directly to each other. They can talk to the base station operator, but not to each other. The solution is to replace the base station with a repeater. The *repeater* picks up the transmissions of Mobile #1 and retransmits to Mobile #2. This requires two frequencies (one for the mobile to the station and a second from the station to the mobile).

The repeater normally used to provide long-range communications is the Motorola GR1225 or Icom R3000/4000 series which are both priced in the two thousand dollar range (excluding antenna system).

The second problem involves use outside the vehicle. As you will note from the diagram above, we have a police officer pictured at the left and a fireman at the right using handheld radios. The *reception* range of a handheld is nearly equal to that of a mobile (assuming the use of a good quality handheld radio), but the talkback range is typically limited to less than half the range of a mobile.

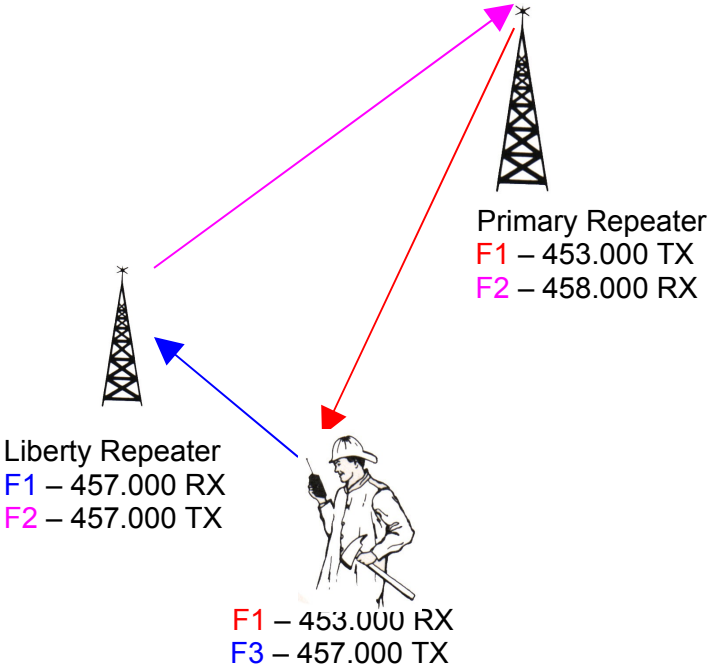
The second problem occurs when a system has been built to serve an area that was adequate years ago but is inadequate in serving current needs.

The example below shows how this can happen. In this example, we are showing five fire districts served by a single county UHF repeater system operated by the Alabama Forestry Commission.



As you will note from the diagram above, districts 1 – 4 are adequately served by the existing repeater. However, a new fire district (5) is primarily outside the coverage area of the main repeater. Users in this area are subject to poor communications and page reception capability in the eastern part of their coverage area and NO coverage in the western area. There are several ways to resolve communications problems in Area 5 using the Liberty Repeater.

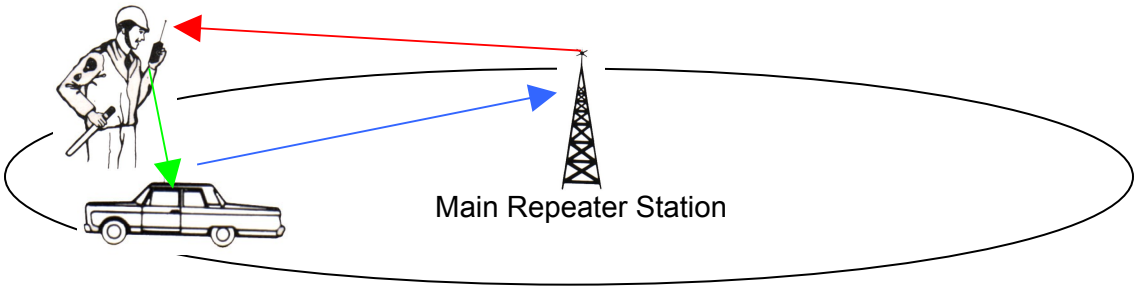
One solution would be to install a Liberty Repeater at a fire station centrally located within Area 5 by installing a *Pocket Repeater.* This system would work if units in Area 5 could receive but not transmit. In simple terms, we install the Liberty Repeater with a third frequency to repeat from mobiles, handheld radios within Area 5 back to the Primary repeater. The diagram below shows the use of the two existing frequencies already used by the primary repeater and the third frequency used by the Liberty Repeater may better explain how this system extends coverage.



There is another variation of the Pocket Repeater concept that is applicable for law enforcement users. Due to the fact that the Liberty Repeater operates on 12 volts (it

uses a 110 volt AC adapter for fixed station use), it is well suited for use as a vehicular repeater on UHF systems. Measuring only 2.125" X 8.0" X 5.75", the Liberty Repeater weighs a mere 3.5 pounds. With built in mounting flanges, the Liberty Repeater can easily be installed in virtually any vehicle.

You will recall an earlier reference to the limited talkback range of handheld radios. It is extremely important that a police officer have the same communications capability from a handheld (actually MORE important) than they would have from a mobile. The Liberty Repeater can provide this capability for UHF system users. The diagram below will better illustrate how this works.



Frequency 1 – Transmitted by Main Repeater station. Received by mobile and handheld

Frequency 2 - Main Repeater station receive frequency. Can be heard directly from mobile, but not from handheld due to talk-back range limitations of handheld.

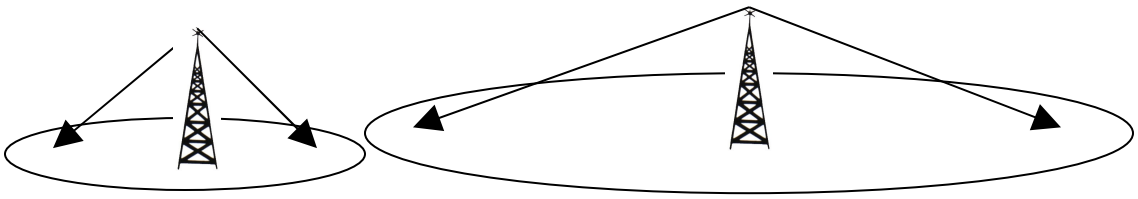
Frequency 3 – Cross-link transmit frequency from handheld. Received by mobile and retransmitted on mobile transmit frequency to Main Repeater Station.

Now, let's look at one more application – the need to provide repeater communications in a weak signal area plus the additional requirement to enhance paging transmissions. This can only be done by adding a repeater in the weak signal area. This is a common problem with volunteer fire departments being served by the Alabama State Forestry UHF Radio system.

Without going into the details, we will simply say at this time that getting financial approval and FCC licensing for an additional repeater in any given area is extremely difficult. First, a new FCC license would be required. When granted, it will be on one of the new narrow band 12.5 KHz authorizations. This means that many existing mobiles, handhelds, and pagers will be incompatible since many (if not most) are designed to operate only on 25 KHz frequencies.

This is where the Liberty Repeater proves its merit since we can show you how to use the Liberty Repeater on readily available standard 25 KHz channels. For future planning, you'll be glad to know that the Liberty Repeater can operate on both 12.5 and 25 KHz channels.

By setting up a Liberty Repeater in a problem coverage area, you can enjoy enhanced coverage with no licensing problems and very little cost.



Liberty Repeater Coverage Area

Primary Repeater Coverage Area

Are you ready for the price?

It is only $895 for a complete UHF repeater ($1,895 for the VHF Radius GR1225). To this, you will need to add the cost of the antenna, transmission line support system, and tower (for fixed installations). The cost for the antenna system is as follows:

1) For a mobile pocket repeater application - $25

2) For a mobile repeater application - $25

3) For a fixed station 5-10 mile system - $780
   Antenna - $195
   Line Kit - $195
   30' antenna support tower (Rohn #25G) - $390

4) For a fixed station 10-15 mile system - $1,485
   Antenna - $695
   Line Kit - $395
   30' antenna support tower (Rohn #25G) - $390

Note: Installation is not included. In most cases, the antenna system for fixed installations can be done with your own personnel (a concrete footing is required for the 30' tower). Installation instructions are available on request.

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