

Ron's Application Notes

Electronic Surveillance Made Easy

Step by Step

Application: Body Wire Repeaters

Application # 5

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Security Level None

Body wire repeaters can be broken into 2 categories. First the standard in-band repeater. Here the repeater takes in a frequency that is repeated out a few megahertz away from the incoming frequency. That is, if your tactical frequency is, lets say, 154.000 Mhz, then they output of the in-band repeater must be 4 to 5 Mhz higher or lower than the input frequency. So, the typical in-band repeater would be on 159.000 Mhz. The typical separation is normally 5 Mhz. This allows the repeater to operate without interfering with its self.

I am asked many times over the years, why the separation? And why 5 Mhz? The answer is simple. As I mentioned above, the input frequency must be 5 Mhz up or down from the output frequency so that there is not an interference between the two frequencies. Now, the second reason why we need the separation is because the repeater requires a duplexer in the repeater for the unit to operate properly. The duplexer is a device that keeps the two frequencies seperated in the repeater. It is a mechanical device that is tuned to the input and output frequencies. If you understand all that I have explained, you are way ahead of the game.

Now the cross band repeater. Here the repeater receives your body wire signal and repeats it our on a out of band frequency. Lets say your wire is on 154.000 Mhz and your department is on one of the new 800 Mhz systems. So, the cross band repeater will receive your wire signal on 154.000 Mhz and repeat it out on one of your talk around mobile to mobile frequencies on 800 Mhz. Easy huh?? Generally yes, but you must get your radio tech involved. He in turn, will disable the portable radio's Time-out-timer (TOT) and put the portable on a mobile to mobile frequency. This will allow your team to listen in on the wire signal and keep the UC or CI safe. Normally, one does not use the repeater 800 frequencies for an operation using wires. If you chose to use an 800 Mhz repeater frequency, the TOT's must be disabled in the repeaters involved in the operation. Your radio tech will go bananas.

Things to do and not do testing your repeater.

First, connect your input and output antennas. A dummy load on the output of the repeater is recommended for testing purposes. Connect the 12 Vdc cable. DO NOT remove the output antenna while the repeater is on. Turn on your receiver and set it on frequency. Turn on your wire and check out the system on a local bases. It is always good to check out your installation in simulated operation, that is, check your range!

Installation of the repeater and antennas.

I think the largest problem with repeater is antenna placement. With an in-band repeater you only need one antenna. (That is another job that the duplexer does) This antenna can be placed almost anywhere. Of course, the best place is a magnet mount on the trunk of the car. Window mount antennas are also available. With advent of plastic bumpers on the new cars, one can place an 800 Mhz magnetic mound antenna in the car frame work right next to the bumper and generally cover the local team with good coverage.