

## EMRG Article #5: OARC Groundwave – May 2009

This month I am writing about trunked radio, a technology used every day and in emergencies. While Amateurs do not use trunked radio, there are plenty of references to it on Amateur web sites, and most make trunked radio sound like a non reliable, failure prone solution. In fact, there are hundreds of trunked radio systems operating across Canada, some for over 20 years, and most are very reliable. For Amateurs, what is important is that the people we support are not on trunked radio, humanitarian groups have no radios, which is why they need our help.

Trunked Radio, sometimes called Trunking Radio, is everywhere and it is here to stay. In the US, most areas have, or are building State wide radio systems. The main reasons for creating a large trunked radio system is better use of spectrum (better sharing of radio channels), larger coverage areas (radio coverage for Town A no longer ends at their border) and interoperability (it's easier if everyone is on the same radio system).

In a trunked radio system, a set of radio channels is shared by multiple user groups and the system assigns an available channel each time the user presses the PTT button, rather than having the user change channels. For example, in a normal City, Police, Fire, Paramedics and Public Works might all have a main and secondary frequency for a total of 8 single repeaters. At any point in time only a few of the repeaters are in use, but each group has enough capacity to meet their peak requirements. These 8 repeaters could be replaced by a single 5 channel trunked radio system. There were about 16 VHF/UHF frequencies assigned to fire departments in Ottawa prior to amalgamation, while now they are one of many users on the City of Ottawa 15 channel trunked radio system.

There have been a lot of challenges implementing trunked radio systems. Typically, multiple user groups (Police, Fire, Paramedics, neighbouring Cities), who each had their own dedicated radio systems, are merging onto a single shared radio system. In most cases these original systems were lowband VHF (below 50 MHz), VHF (138-174 MHz), or UHF (412-512 MHz), which had certain characteristics such as wide area coverage, and they are being replaced by an 800 MHz system which has limited coverage area per site, so more sites are required. Poor engineering and a desire to save money have created radio systems that fell short of user requirements, leading to complaints.

Unlike a conventional repeater, where the repeater output is activated when there is a signal on the input, trunked systems have a computer controller and each radio must communicate with the system each time it wants to make a call. Some view this as a weak point, but actually most of these have built in redundancy with stand alone operation if links between sites are down and failover to conventional repeater mode if the controllers fail. There are benefits to the computer interface on trunked radio

systems, beyond the better use of spectrum. It is possible to know exactly who is using the radio system, when and for how long. It is also possible to know how many people tried to use the radio system, but there were no channels available, and how long they had to wait to get a channel assigned. In California, they have been able to make adjustments to the radio systems, so when they are used for forest fire fighting, they have the capacity to ensure that when someone pushes the PTT, they will get through.

What is important for Amateurs to understand is that the groups using trunked radio are not the groups who needed Amateur radio communications in an emergency. The people who need our help now are the same people who needed our help before trunked radio came along, the groups providing humanitarian support who have no radios.

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