



Emergency Measures Radio Group Ottawa ARES

Two Names - One Group - One Purpose



General Meeting

Date: Saturday April 27, 2002
Time: 9:00AM - 12:00PM
Place: Teron Road Fire Station
(Near Kanata OPP station)

Agenda:

- EMRG Update
- Red Cross
- Portable Repeater & Repeater Extender demos & discussion
- Next Exercise
- Training Session
 "Operating in a directed net"

Team Leaders Message

So far it has been a quiet year with respect to emergencies, although I did get a test call from the City of Ottawa as part of their biohazard exercise in March.

There is quite a bit of activity as each of the management team members gets their respective areas organized. The membership notes section is an example, where Liz and Tom have established clear membership policies, which should end any confusion and frustration that people felt in the past.

Clayton has been busy talking with the Red Cross about possible training opportunities and Mike has been testing and tuning the old Ottawa Fire Dept VHF truck duplexer cavities we received (See article on repeater extender).

As always, John is keeping busy with exercise planning and how we can work with other groups, such as the Red Cross on joint exercises. Rick has selected a standard DC power connector for EMRG (see article on DC power connector) and will soon have some equipment to inventory.

The general meeting this month will be at a former City of Kanata fire station on Teron

Road. By moving the meetings around the City, no one has to drive a long distance every time and it helps introduce EMRG members to areas of the City that they may not know.

The Ottawa Fire Dept is very supportive of EMRG and is pleased to make space available for us to meet. With amalgamation of the Fire Dept, some dispatch centres will close, possibly impacting EMRG access to amateur radios in these locations. The Division Chief of Communications for the Fire Dept has been discussing options with me, to ensure that EMRG maintains equivalent capabilities.

Peter -VE3BPQ ve3bqp@rac.ca

Low Power Communications

Having the ability to communicate effectively with low power (less than 10 watts) radios is critical for emergency communications. There are several reasons or situations that make low power communications so important;

- Lower power = longer battery life
- High power (such as mobiles) may interfere with reception on other radios in close range (fire and ambulance)
- Vehicles are heavy to carry, so a hand held radio is a better choice for places where a car cannot go

There are several ways to improve low power communications;

- Extendable antenna for HTs
- Portable mast and antenna
- Portable repeater -ensures the repeater is within range of the users
- Repeater extender (see next article)

Typical amateur VHF mobile radios have 40 to 60 watts on high power, which can be too much. Think about ways to communicate with less power. It may make the difference in an emergency.

Membership Notes

The Ottawa EMRG/ARES membership year will run from September 1 of each year to August 31 of the following year.

Once a year, between September and the end of October, we will be requesting updates from members who wish to remain active with the group. These can be sent to Tom VA3WTJ and Liz VA3ELB by email, mail or telephone. For those members who have submitted a completed application form in the previous year, a simple confirmation of current information is satisfactory. Any changes since the last update should be provided at that time (such as email address and telephone number). As the callout list for any situations requiring EMRG/ARES is based on this data, it is important that it be current. Thus, any changes during the year should be sent to allow an accurate update of the database.

If a confirmation of information is not received at this time, it will be assumed that the member has chosen *not* to be included on the active list. In this case, they will continue to receive the newsletter for one more year but will be placed on an inactive list. After this time, if no update is received to confirm that the member chooses to be on the active list, they will be taken off the mailing list and will be deemed inactive until notice is given that they would like to be included again. At this time, a new application form with current information will be required for the database.

Anyone who is not sure when they provided their last update can contact us to confirm when their information was last updated. Email, if available, is the most convenient but please use the method best for you.

Tom VA3WTJ & Liz VA3ELB
va3wtj@rac.ca va3elb@rac.ca

OVMRC Flea Market

May 4 2002 at the Stittsville arena

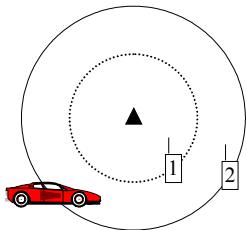
Open to the public at 0900

Admission \$3.00.

Repeater Extender

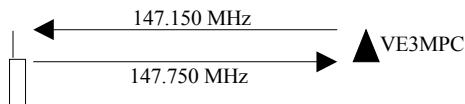
A "Repeater Extender" or "One Way Repeater", extends the transmit range of hand held or other low power radios to allow access to repeaters from areas that would normally be out of range.

The drawing below shows a repeater and its' coverage area. For the examples in this article, we will use VE3MPC (147.150 RX 147.750 TX)

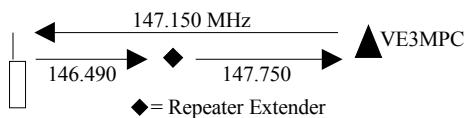


- The centre triangle is the repeater
- The inner circle is the coverage area where a hand held radio can clearly transmit into the repeater
- The outer circle is the coverage area where a mobile can clearly transmit into the repeater and a hand held can clearly receive from the repeater

In normal operation, the frequencies and communications paths for VE3MPC would look like this:



When using the repeater extender, the radio uses the same receive frequency (147.150), but transmits on a simplex frequency (say 146.490). The repeater extender receives the simplex frequency and transmits at the same time on the repeater input frequency (147.750). The frequencies and paths for VE3MPC with a repeater extender would look like this;



Programming a radio to work with the repeater extender requires the use of the odd split capability. Amateur VHF repeaters normally use a 600KHz difference between transmit and receive frequencies.

In the future, EMRG would like to create repeater extenders for each of the local repeaters. Part of the EMRG operations plan, would be a list of repeater extender frequencies that EMRG members could program into their radios for use in an emergency.

Equipment

The duplexer (set of cavities) for the repeater extender project, came from the old City of Ottawa VHF truck repeaters for the old VHF hand held radios. The current system, uses UHF hand holds and crossband repeaters in the trucks.

In their original configuration, there were 4 cavities bolted together, but to work with the close frequency spacing available for amateur radio, 6 cavities are required.

The following photo shows the six cavity set that Mike Kelly (VE3FFK) has configured. The cables that link the cavities together have not been installed in this photo.

- In the upper left corner of each cavity, is the connector which is attached to the coupling loop (see photo of coupling loop)
- In the centre, is the shaft for the tuning rod



If you want to try programming your radio, here are the Repeater Extender Frequencies to program into your radio.

- Receive: 147.150 MHz
- Transmit: 146.490 MHz

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The next photo is the bottom of the six cavities, but the bottom plate is removed from the centre 2 cavities, exposing the tuning stubs. To the upper left of the tuning stub, is the coupling loop.



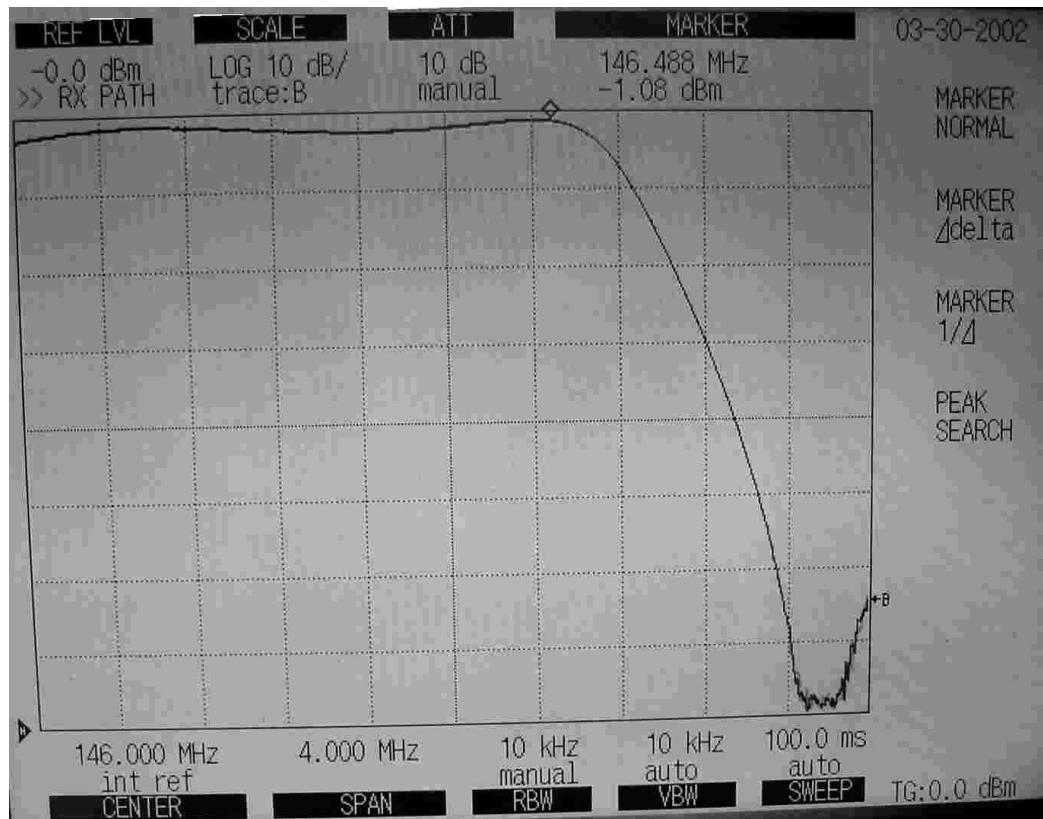
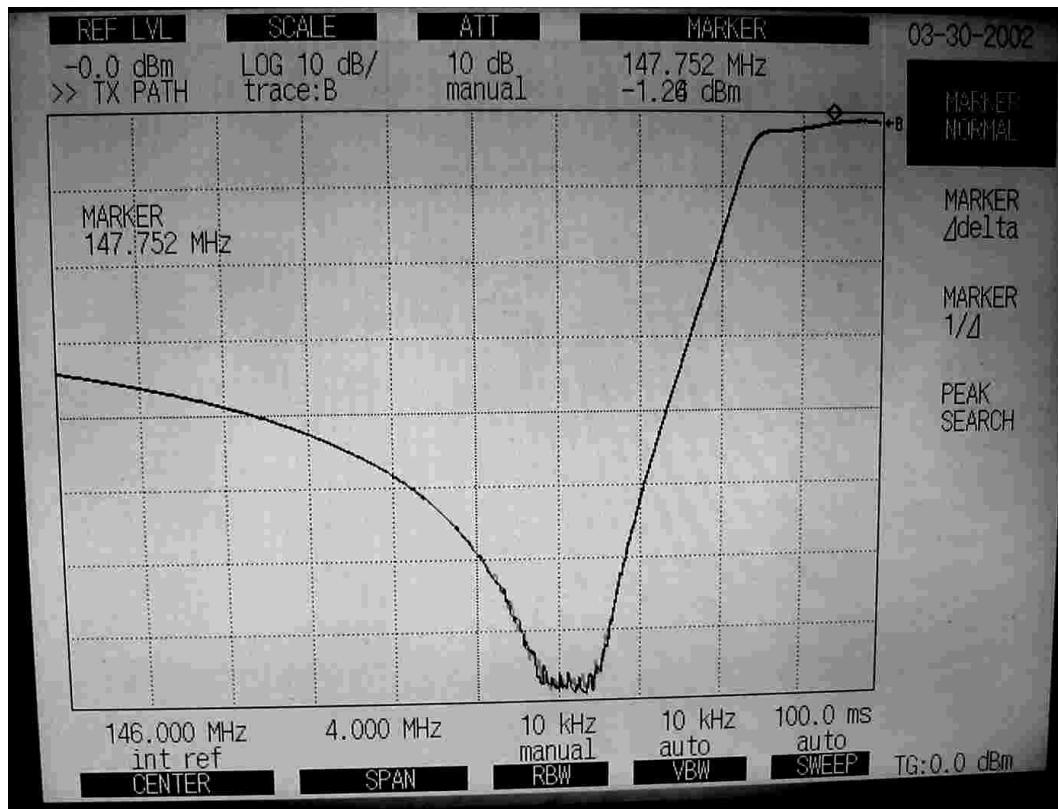
The final photo shows the coupling loop. The loop extends into the cavity and has an adjustable capacitor for setting the rejection frequency.



The two photos on the next page, show the frequency plots for the cavities. The centre line in each plot is 146 MHz and the top line is 0dBm.

The first plot is for the Transmit cavities. To the right of centre is the notch for the receive frequency of 146.490, while further to the right is the pass band for the transmit frequency of 147.150.

The second plot is for the Receive cavities. To the right of centre the plot for the pass band drops off after the receive frequency of 146.490 and notches the transmit frequency 147.750.



WHY TESTING PAYS OFF

The EMRG portable repeater was used for the two day Ski Marathon this year. The repeater worked flawlessly from sun up to sun down, for two days straight. The intense use of the ski marathon (very much like an emergency) identified one very annoying problem. The end of transmission tone and repeater ID were TOO LOUD. People listening to a low level voice signal were blasted by the tone at the end of each transmission.

While the repeater has been used on many occasions in the past, the level of activity and criticality of the information never brought out just how much of a problem the volume level of the tone and ID could be.

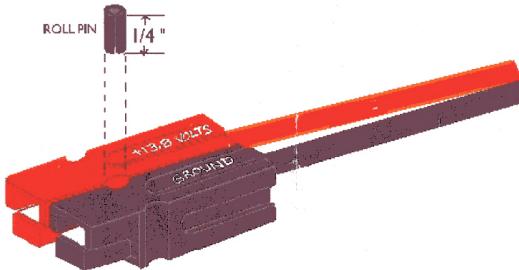
This is an example of why exercises and practice are so important. Finding problems during a critical situation is not a pleasant experience, but many problems only become evident during extensive use.

STANDARD POWER CONNECTOR

EMRG now has a standard DC power connector. Equipment coordinator, Rick Furniss (VE3IHI) reviewed various options and looked at the ARRL and other amateur radio groups recommendations. The final selection, is the Anderson PowerPole, available through PowerWerx in the US (www.powerwerx.com).

The standard connector will be installed on all equipment used by EMRG, including radios & power supplies at the EOC, Red Cross, Fire Stations and spares. The purpose in standardizing on a connector is to allow any radio to work with any power supply, battery or DC adapter cable.

Individual members are encouraged to use the connector, but are not required to do so. Each member will receive one connector to build an adapter from their personal standard to the EMRG standard and additional connectors will be available for sale.



Anderson PowerPole 15Amp Connector

The City of Ottawa purchased the connectors, fuse holders, red and black wire, crimp tool and a tool box to keep it all in.

IT'S THAT TIME OF YEAR

Hamfests and garage sales are starting up, so now is a good time to think about emergency preparation. Building up a communications emergency kit will make your radio equipment more useful in an emergency.

Keep an eye out at ham flea markets for a length of coax, a used antenna or a spare radio. Garage sales are great places to pick up an old suitcase or toolbox to keep a few tools, tape and cables ready for an emergency. Adding a few items each year ensures that you don't spend a lot of money, but you do get better prepared each year.

Emergency Preparedness Week

May 6 to 12, 2002

Emergency Preparedness Week is an annual event designed to build public awareness of these risks and how to plan and be prepared for any type of emergency.

During the week, a variety of events and activities are organized in the communities of every province and territory of Canada.

Emergency preparedness is a shared responsibility. It begins with you.

For more information, visit the Emergency Preparedness web site at;

<http://www.emergencypreparednessweek.ca/>

CLARITY IS IMPORTANT

There were many lessons from the Swiss Air crash off Nova Scotia, but one is not in the official records. A long time friend and Nova Scotia ham noted that people wanted the clearest, most noise free communications method they could find. This included amateurs, who would resort to cell phones, instead of a noisy VHF link.

In today's wireless world, people have come to expect crystal clear communications. While in an all out emergency, people will take what they can get, the pressure to replace noisy communications systems, will be strong. Portable cell sites and radio systems can be deployed in fairly short time after a disaster.

Amateurs doing emergency communications planning must look at the quality of communications capabilities that are available. Cities like Ottawa have many repeaters, but there are areas of overlap and areas that are not served well by any repeaters. The 50 watt mobile may just make it into the repeater, but in an emergency, battery operation with 50 watts may be a challenge.

There are ways to improve communications, including using better antennas at remote sites, portable repeaters and repeater extenders. In some cases, the use of CTCSS tones can allow two repeaters to operate at opposite ends of the City, but share a common frequency. This would allow more repeaters, without using up more VHF repeater pairs.

The next time there is an event on the air, such as a soccer tournament, bikeathon or walkathon, listen to the communications. Don't listen to the words, listen to the quality. If this was an emergency, would you consider all sites as providing reliable, clear communications.

The point here is that there is more to radio communications than just getting a message through after multiple resends. Signal quality is important and we all need to ensure that we are producing and transmitting the best signal that we can.

TRUNKED RADIO PRIMER

As many people know, the City of Ottawa is slowly moving all users over to the EDACS trunked radio system. The original users were the police, followed by the old Regional Transportation Dept. Now bylaw enforcement and soon the Fire Dept will share a common radio system. But what is trunked radio and why is it so popular.

In conventional Mobile Radio systems, each agency would have its own dedicated radio system for Police, Fire, Bylaw enforcement, etc. Each system must have enough capacity to handle an emergency, but under normal conditions, the system is underutilized. There are periods of time, when each agency experiences overload and low use, but there is no way to share capacity between agencies.

In trunking systems, all users share a common set of radio channels. Whenever the push-to-talk (PTT) button is pressed, the system finds a free radio channel and assigns it to the call. A new radio channel is assigned for each press of the PTT button, even during the same conversation.

If all channels are in use, the call is automatically queued until a new channel becomes free. Free channels are assigned to the queued calls on a first-in, first-out basis, unless there are overriding priorities assigned to the user or the group. By setting user priority levels, if only one channel is available and a police officer and water works employee both tried to make a call, the system would assign the channel to the police officer.

Trunked radio systems get their name from the trunk line used in commercial telephone communications. A trunk is a communications path between two or more points, typically between the telephone exchange and one or more users, or between two or more radio channels.

Trunking ensures highly efficient use of available radio spectrum and virtually eliminates the delay traditionally experienced when trying to get a clear radio channel.

Next time; fleets & subfleets.