



EMERGENCY

COMMUNICATIONS PLAN

FOR

EMERGENCY AND DISASTER USE

IN

B.C.'S SOUTHWEST REGION

LOWER MAINLAND AND FRASER VALLEY

MAY 2007

PEP SW REGIONAL EMERGENCY COMMUNICATIONS PLAN

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PREAMBLE

This Emergency Communications Plan was prepared under consideration of:

- Current designated frequencies for all municipalities
- Population sizes of each municipality
- Assumption on emergency communications
- BC Frequency Coordination Council band plan
- Communication needs in emergencies based on actual disasters
- Resistance of some emergency communications organizations to change simplex frequencies

To ensure each municipality/emergency communications organization can use these simplex VHF frequencies, it is recommended to use the least amount of power output when communicating with another station.

On Page 5-9 you will find some information but not limited, to alternate emergency communications methods you can use or implement in your community.

In case of any interference use courtesy and make your transmission based on priority. If the need arises, one station should become a net control station.

The original draft of this plan was prepared by a large group of volunteers under the leadership of Tom Cox, VE7TOX in 2000. We thank Tom Cox, who moved to Edmonton a few years ago, for this important contribution to the PEP SWE Region.

Any suggestions, corrections or updates should be made to the PEP Regional Emergency Radio Representative who is the co-chair of the 2007 Emergency Communications Planning Group. (enter email address, when assigned from PEP HQ)

EMERGENCY COMMUNICATIONS PLAN LOWER MAINLAND AND FRASER VALLEY

GROUP ONE

Vancouver, North Shore, Burnaby, Richmond, Delta, and Bowen Island

Emergency Operations	Club Repeater + designated simplex
Regional Check-ins/Situation Reports	146.940- VE7RPT
Inter-municipal emergency simplex	146.565 Simplex 3

GROUP TWO

Surrey, Langley, Port Moody, Port Coquitlam, Coquitlam, New Westminster, White Rock, Pitt Meadows

Emergency Operations	Club Repeater + designated simplex
Regional Check-ins/Situation Reports	146.940- VE7RPT
Inter-municipal emergency simplex	146.490 Simplex 6

GROUP THREE

Chilliwack, Hope, Kent, Harrison, Abbotsford, Mission, Maple Ridge

Emergency Operations	Club Repeater + designated simplex
Regional Check-ins/Situation Reports	146.610 - T110.9 VE7RVA
Inter-municipal emergency simplex	146.445 Simplex 3

	GROUP 1	GROUP 2	GROUP 3
Simplex 1	146.415	Provincial Regional Emergency Operations Centres (PREOCS)	
Simplex 2	146.430		Abbotsford
Simplex 3	146.445		Inter-municipal
Simplex 4	146.460	Vancouver	Mission
Simplex 5	146.475	Richmond	Kent/Harrison
Simplex 6	146.490		
Simplex 7	146.505	Richmond	
Simplex 8	146.520	Universal Calling	Universal Calling
Simplex 9	146.535	North Shore	
Simplex 10	146.550	Bowen Island	
Simplex 11	146.565	Inter-municipal	
Simplex 12	146.580		
Simplex 13	146.595	Burnaby	
Simplex 14	147.420	Vancouver	
Simplex 15	147.450	Vancouver	Maple Ridge
Simplex 16	147.480	North Shore	Chilliwack
Simplex 17	147.510	Burnaby	
Simplex 18	147.540	Delta	Abbotsford
Simplex 19	147.570	Delta	Hope

High Frequency (HF)

HF radio, operating in the 3 to 30 MHz portion of the radio spectrum, can be put into service at any EOC. A piece of wire, precut to length appropriate for the frequency you plan to use becomes the antenna. Coaxial cable to connect the antenna to the radio, a couple of trees to support the antenna, a power source, you're on the air. It sounds very simple, but it should be noted, very few EOCs have convenient trees of a size to get operational antenna height and orientation. We strongly recommend antenna installations in your emergency planning. A vertical antenna (whip) for HF is not that noticeable.

The main advantage of HF over VHF is the distances that can be covered. Unless linked repeaters are used, VHF is line of sight while HF signals can travel around the world. Every EOC should have an HF radio in addition to VHF/UHF equipment. If a VHF repeater goes off the air, a VHF linking system would become inoperative. The HF radio would keep EOCs in contact with other stations 100 or more miles away. If the Green Timbers Provincial Emergency Operations Centre (PREOC) is down, Kamloops PREOC is the backup.

During a disaster or other major emergency, HF radio is the usual mode for transmitting Health and Welfare traffic (messages). Persons anywhere in the world wishing to know about family or friends could request an Amateur Radio Operator to send a message to the affected area on their behalf. It might take several operators to get it from the place of origin to its destination. The message would then go to an agency such as the Canadian Red Cross or Salvation Army. They would attempt to locate the person requested. For example, all people going to an ESS reception centre are registered. When a cross-match is found between registrations and a piece of traffic, a message to the originator is generated. Health and Welfare messages would be handled by ARES members or other qualified operators using the National Traffic System (NTS).

It should be noted that Provincial Emergency Program stations will not accept H&W traffic on their coordinated operational frequencies. Messages may start on VHF and be passed on to HF. ARES members in Canada and the United States work together so Canadians and Americans can pass this traffic to just about any country in the world. In fact, after Hurricane Katrina devastated New Orleans, many Health and Welfare messages were handled by Canadian operators.

Military personnel can send and receive messages on the Canadian Forces Amateur Radio Service (CFARS) system, which is operated on specialized HF frequencies by Amateurs qualified to do so. The Military Affiliated Radio Service (MARS) similarly handles USA military personnel Health and Welfare traffic.

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HF is usually propagation dependent; sunspots can adversely affect the ability to operate on HF frequencies. Certain frequencies work best at night, some during the day and some at anytime of the day. Knowledge of propagation is an asset to an HF operator.

HF stations can operate any mode including upper and lower sideband voice, CW (Morse code), AM, FM and digital modes. These include packet, pactor, RTTY (radio teletype), fast and slow scan television, WEFAX (weather FAX). Many of the non-voice modes operate with a computer interface and can be completely automated.

High frequency radios usually have an output of 100 to 200 watts. The peak effective power can be higher, depending on the antenna configuration and transmission mode. On single sideband (SSB), the HF radio can also have a linear amplifier for a maximum power of 1,000 watts or 2250 watts peak effective power. It would require commercial power or a robust generator to operate the linear amplifier. If commercial power is not available, an HF radio can be run from a generator or a vehicle battery.

Notes:

HF 3 to 30 MHz

VHF 30 to 300 MHz

UHF 300 MHz to 3 GHz

Broadcast band AM radio is within the MF band, 300 kHz to 3 MHz

New Technologies for use in Emergency Communications

A variety of new (and some old) technologies currently in common use by amateur radio operators are worth considering for use in the event of disaster that results in loss of traditional communications such as telephones, cell phones and trunked radio systems etc.

A few worth considering are:

APRS (Automatic Position Reporting System)

In its simplest implementation, APRS is used to transmit real-time reports of the exact location (determined by GPS) of a person or object via a data signal sent over amateur radio frequencies. APRS is also capable of transmitting a wide variety of data, including weather reports, short text messages, radio direction finding bearings, telemetry data such as water levels, and storm forecasts. Once transmitted, these reports can be combined with a computer and mapping software to show the transmitted data superimposed with great precision upon a map display. Ideal for tracking assets and threats in an emergency.

Video and Images

The transmission of video and images is typically achieved with ATV (Amateur TV) for video with motion on VHF and higher and SSTV (Slow Scan TV) for transmission of single frame images over HF and higher. WEFAX is a fax protocol used on HF to acquire fax images of weather reports but can also be used for transmitting single images.

In addition to the above, BCWARN (BC Wireless Amateur Radio Network) supports transmission of full motion, high resolution video from DV Camcorders etc. on its high speed 2.4g Wi-Fi network. In addition, large jpegs can be transmitted from digital cameras due to the higher speeds available on the Wi-Fi backbone.

D-Star

D-Star was developed by the Japanese government and is administered by the JARL (Japan Amateur Radio League). Currently implemented by Icom and soon others, D-Star supports digital voice and low speed (1200bps) data on its VHF and UHF repeaters and radios. Digital voice and medium speed data (128kbs) are supported via 1.2g repeaters and radios.

Although this is relatively new technology for the amateur community it is analogous to the P25 initiative underway in the commercial sector. Digital radios and repeaters occupy significantly less spectrum in comparison to analogue systems.

WinLink and Airmail

Initially developed to provide sailors access to email via HF, Winlink has expanded its capabilities significantly and is in use around the world providing email over HF, VHF, UHF, 1.2g, 2.4g and the Internet. On HF, AX25 packet and Pactor1, 2 and 3 are typically used. On VHF and higher, AX25 are commonplace.

Telpac nodes provide a gateway between VHF/UHF packet and telnet access to the WinLink system. These are a convenient way of accessing email from any location that supports Telpac nodes.

Satellite

Satellite systems have been part of amateur radio since Oscar 1 was launched in 1961. Since then over 70 amateur satellites have been launched. Two upcoming birds to watch for in the next 2 – 3 years with respect to Ecomm are P3-E and Eagle. Both will have highly elliptical orbits, meaning they will be visible for extended periods of time, and they will have slow speed data transmission capabilities accessible at UHF and higher.

In addition to amateur satellites, many commercial satellite systems are worth considering for Ecomm purposes. Relatively inexpensive ground stations (under \$2000) can provide data speeds up to 3mbs in areas that are within the satellite footprint. Not only does this provide data access but also VOIP. Although traditionally expensive to operate, flexible plans are increasingly becoming available that allow creative approaches such as paying for time you use rather than a large monthly subscription fee.

IRLP and EchoLink

Both are technologies that support voice communications via repeater systems or nodes, linked via the Internet to other repeater systems or nodes. Essentially this means that a handheld transceiver can access resources well outside the area of operations by linking through the Internet, greatly extending access to resources.

220MHZ

One of the overlooked areas of spectrum is the 1.25m band. It has propagation characteristics similar to 2m yet is virtually devoid of use, unlike 2m and 70cm. This band is well worth considering for new repeater systems, packet links and packet digipeaters in areas that 2m congestion precludes expansion in.

FRS / GMRS Radios in the Emergency Preparedness Plan

General Mobile Radio Service (GMRS) radios, which include the frequencies of the Family Radio Service (FRS), are commonly referred to as walkie-talkies. GMRS/FRS, or low power radio service consists of frequencies in the 460MHz range and do not require a license.

The use of these radios as a primary tool for emergency management communications is impractical due to their widespread use by the public, the lack of coordination and their limited range.

However, GMRS/FRS radio systems could provide some localized emergency teams with an ideal tool for area-specific operations. Trained neighbourhood emergency preparedness teams may find this to be a valuable device to coordinate their light search and rescue, damage assessment and emergency medical activities.

Established community teams could add this very useful tool to their disaster response equipment, allowing quicker and safer community based responses to neighborhood needs.

Municipal emergency operations could further benefit from the localized use of GMRS/FRS by integrating their use into an Emergency Social Services (ESS) Reception Centre. These radios would be perfectly suited to coordinate the resource needs and inter-component activities in this environment. Community emergency communications personnel at this facility could monitor the working frequencies and provide a link to other facilities (i.e. EOC) or jurisdictions using advanced communications equipment and capabilities (i.e. amateur radio, packet, etc). Caution should be exercised with regard to the protection of personal information when using GMRS/FRS frequencies as communications by this means is easily monitored by anyone with one of these radios.

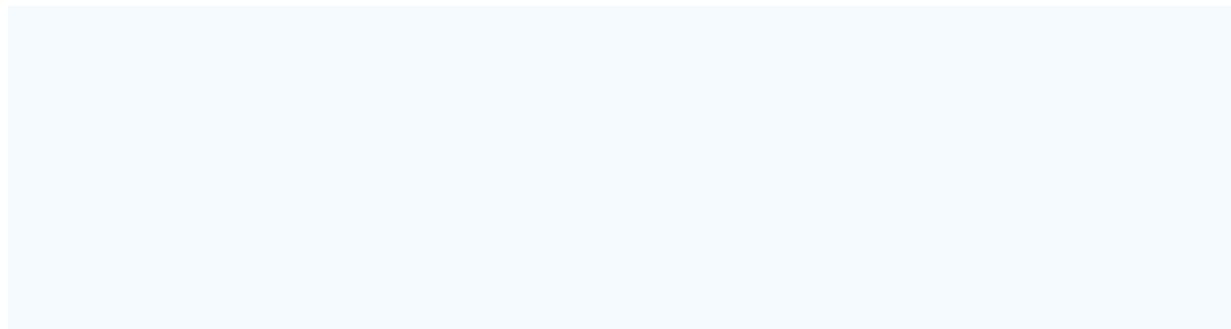
Municipal emergency operations centres may also choose to monitor the GMRS/FRS frequencies as a means of intelligence gathering. In some jurisdictions, the GMRS/FRS channel 1 has unofficially been designated as the emergency calling frequency. By monitoring this and other channels, officials may be able to obtain a broad, though unverified, situational perspective in the area. Attempts to engage in two-way correspondence and activity coordination using this mechanism would be logistically challenging and could detract from emergency traffic on more established communications means.

Inter Municipal Emergency Radio System (IMERS)

The IMERS is a NET for EOC to EOC to support or enhance primary means of communications between EOC's. The system was original developed with a handful of municipalities growing throughout the GVRD. The current system is without governance however, technical aspects of the system hanve been maintained by staff at the GVRD. Operational administration of the system has been left up to participating users. Currently the system has the following authorized users in the system.

- 1). Vancouver
- 2). Burnaby
- 3). New Westminster
- 4). Port Moody
- 5). Coquitlam
- 6). GVRD
- 7}. North Vancouver
- 8). West Vancouver
- 9). Surrey
- 10). Delta
- 11). White Rock
- 12). Langley
- 13). Terrasen Gas
- 14). BC Hydro

Until there is a need all operations on IMERS is on an open net and a directed net will be imposed if there is too much traffic. PEP will assume or delegate as situations dictate and be the coordinating body. Requests to impose a directed net will be made through your Emergency Communications Officer or designate to PEP.



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List of Amateur Radio Organizations will inserted at a later time