

**REPORT on Amateur Radio
Simulated Emergency Test (SET)
October 4, 13, November 13, 2014**

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On behalf of: The Elmira Amateur Radio Club (VE3ERC) members
To: Deputy Chief Dale Martin (Emergency Coordinator)
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This brief report consists of the following:

- 1. Background**
- 2. The Plan: Parts A, B, C, D**
- 3. Executive Summary**
- 4. A Compiled Summary of Comments and Ideas by participants**
- 5. Appendix A: Previous Report Sept. 18, 2011.**

1. BACKGROUND:

VE3ERC , the Elmira Amateur Radio Club, is part of the Township of Woolwich Emergency Plan as specified in section 4.6 and 16.9 of “The Plan”. HAMS (Amateur Radio Operators) whose Woolwich Volunteer forms are on file with the township are covered under the Township insurance when they are officially called to participate in the Emergency Plan. By Federal Regulation (Industry Canada), possession of the specialized transmitting equipment required to operate on the frequencies and modes allocated to “HAMS” is strictly restricted to licensed operators. These frequencies provide a world-wide gateway for health and welfare messages in the event local cell and hardline channels fail. In general, Elmira Ham operators at evacuation centres, out of harm’s way, focus on transmitting health and welfare communication for citizens ,at those centres, who wish to inform others, anywhere in the world, that they are safe . Historically, when infrastructure collapses during a crisis, hams and their expertise have been ready to serve. The structure and protocol within reasonable expectations of a volunteer are clarified in detail in an internal VE3ERC club memo. With this in mind, the club engaged in 3 SET activities in October 2014 and November 2014 to demonstrate proof of

concept. A fourth, annual USA/Canada 24 hour “field day” in June 2015 will supplement our emergency testing. Subsequently, the club observedin ... Each morning at 8:15 to 9:00 am, the club has a VHF radio check in “net” to ensure that communication thru our repeaters is reliable as well as a regular Wednesday evening UHF net. The club meets once a month to plan and review club operations.

2. The Plan: Parts A, B, C and D

“Part A” was intended to test our ability to transmit from evacuation centres to a net controller who would route traffic to HF base stations able to access provincial and national nets. An IRLP (radio/internet “link”) was used to involve stations at distance from the Waterloo region. This SET coincided with a National SET run by Radio Amateurs Canada/ARES (Amateur Radio Emergency Services). The exercise concluded with a check into the ARES HF frequency 7.065 (OPN- the Ontario Phone Net).

“Part B” was intended to pick up ,logically where Part A terminated. In conjunction with the Boy Scout “Jamboree on the Air (JOTA)” on Oct. 18th, the club demonstrated the ability to operate from a quick-setup field station(s) at the Elmira Fire Hall. Since Scout stations around the world were on frequency, we demonstrated a “proof of concept” for our ad hoc, peer-to-peer emergency plan in a congested, world-wide radio network.

NOTE: A simpler version of this was implemented during the Elmira Maple Syrup Festival 2015. A makeshift antenna was installed adjoining the Lions Hall and used successfully to make world-wide radio contacts. Digital mode contact software was demonstrated to Fire Dept. personnel.

“Part C” involved observation by 5 members of the club of the township SET on Nov. 13th. That scenario involved an aircraft crash at the Waterloo Region International Airport with collateral damage on a neighbouring chemical industry (Safety-Kleen). The observers were at the alternate EOC (Emergency Operations Centre) at the Breslau Community Centre. The team considered how our equipment performed “ on the fly” and how we could interface with the unified command.

“Part D” is an annual 24 hour emergency simulation exercise, “Field Day” conducted each June. Amateur Radio operators across Canada and the USA participate by exchanging call signs and station status over congested radio bands. The Elmira Club operates at a rural site on portable emergency generator power. The station usually involves several transmitters using a variety of antenna.

3. Executive Summary:

A good SET experiences problems so key shortcomings can be addressed before the “real thing” comes along.

VE3ERC recommends that the following major requirements be addressed:

- antenna and coax at the primary EOC (Woolwich Town Hall) and at the alternate EOC(Breslau Community Centre) able to accommodate amateur and emergency services radio is needed. Since the Breslau alternate EOC is still being outfitted, the inclusion of at least 3 coax runs to accommodate HAM equipment should be included in the budget. A retrofit at the township hall is recommended to ensure that radios can radiate properly. High quality coax (LMR 400 FLEX) is strongly recommended.
- storage space at the Elmira Fire Hall which was reassigned when the township bought a longer fire truck should be restored so that HAM antenna and radio equipment can be stored and tested on site on a monthly basis
- access to the Elmira Fire Hall tower, or better, the adjoining water tower, for a permanent antenna installation is highly recommended. The club can provide the radio equipment and antenna and coax, if the township/region can provide the permission, space, power and a “hole” in the wall to run the coax. The equipment must be secure to meet federal regulations so ownership of the equipment must remain with the club and the transmitters must be in locked storage.
- even though the club nets operate daily, scheduled effort needs to be made to test alternate frequencies (147.51) and alternate repeaters on a weekly basis to maintain the integrity of the plan.

4. A Compiled Summary of Comments and Ideas by participants:

4.1 So, What Happened: Oct. 4th?

We were able to process approx.50 location check-ins over the 1.5 hours. We experienced weak and marginal access from several locations (Simcoe, Waterloo, Kitchener, Guelph, Breslau etc.) We experienced the recurring curse of shielding within the arena and township hall. Net control was not focused enough-- this was especially frustrating for marginal stations that just could not get a word in edge-wise. The mobile net control seemed to create some problems too. It is best to have a fixed control— hopefully at the EOC with a dedicated area. Alternate frequencies need to be tested often. Terse check-ins can be practiced on this alternate channel (147.51 or 220).

Our TS440 transmitter “crashed” unexpectedly—The need to check our equipment regularly might be addressed if we could reclaim our storage space at the fire hall. Equipment could be tested prior to each monthly ERC meeting. If the township could provide space on the tower, and drill a hole in the wall, we would provide the coax and the radio equipment to ensure that the system is always “Ready”.

Other common suggestions included: use of charged batteries, provision of a technical manual as well as an operations manual with each club-owned radio, use of headphones in a crowded radio room, use of a mag mount 5/8 antenna or a glass mount antenna. Another participant suggested that the inclusion of IRLP (Internet Radio Link Project) was awkward and unreliable. We will need to review the use of IRLP to access stations at distance.

Simcoe stations reported that:

“Norfolk Amateur Radio Club participated on October 4th and a number of club members had the following comments

1. Several communications that morning were very choppy and noisy. I believe that this was due to hand held radios being used in the Elmira area
2. Net controllers changed with little notice to participants
3. Often times our members would try to check in only to find someone in the Woolwich area covered the transmission. I feel that more control with more wait time between transmissions to allow reflector and repeater handshaking to take place.”

4.2 And What Happened: Oct. 18th?

All equipment was assembled and checked on Oct. 16th.

On Oct. 18th at 8:00 am, our team met at the Fire Hall to set up a set of demo stations consisting of a Morse Code Primer, a CW station, a PSK31 station on 20 m., an HF station on 80/40 and a UHF/VHF station. Antennae were strung using the hall tower, poles and flagpole. The setup was completed by 9:30 am.

Media were present and interviewed club members and Scouts. The Scouts and their Leaders were impressed—so much so, that the club has been asked to repeat the event next year. Some interesting problems included: could not load on the 80 m. antenna which was temporarily attached to the flagpole and tower. (solution: alternate mobile HF antenna pressed into service); a PSK31 computer main board burned (solution: a backup computer was delivered from Kitchener by VA3TET); a fire alarm came thru’ and latecomer guests who had inadvertently parked in the access lanes of the fire hall had to quickly move their vehicles(solution: better signage by the Scouts).

A good exercise is one in which there are problems and the participants prove their mettle by quickly dealing with the problems in ingenious ways. Such was the case today!

The Club should facilitate more liaison with the Elmira Scouts. We are fortunate in that the Scout house is close to the Fire Hall and there are 2 Scout Leaders who are licensed Hams. We have a wonderful opportunity to work with Scouts to obtain their Radio badges, and, perhaps, their BASIC license. We will discuss this in future meetings.

Some of the Key Recommendations submitted, in writing to the club, include:

-use a QSY to simplex net once a week to reinforce terse operating procedures as SET

- ensure our equipment is checked regularly-perhaps, we can store and operate from the fire hall if the township will provide space on the tower and coax access;
- develop a relationship with Scouts perhaps offering free non-voter membership to Scouts and Ventures. We might include a youth coordinator on the board.”
- discuss use of the IRLP and develop protocol to handle volume traffic
- consider thru the glass mounted antennae at the arena and township hall or investigate better ways to make the evac centre communications more reliable
- develop a list of “must haves” for emerg operation. Include technical repair manuals in the event “exotic” software and hardware recovery is required on equipment.

4.3 And finally, on November 13th:

There were observations submitted by our participants on the feedback forms provided by the township related to township and region SET. Significant suggestions included: “use ID badges so names and services can be readily identified and authorized”, “avoid use of jargon so scribes are not confused”, “have a list of helicopter landing sites for night use”).

Relative to amateur radio, there was difficulty working into the primary Elmira repeater, VE3ERC UHF , but several other repeaters VE3IXY (Kitchener), VE3RCK (Red Cross,Kitchener), VE3KSR (Baden CKCO hill) as well as 2 repeaters in Guelph were easily accessed. A mobile cross-band repeater was set up in a mobile in the parking lot so handhelds could access the VE3ERC repeater by transmitting thru the mobile. This was not an attractive solution to the problem. Several coax runs to ham antenna on both primary and alternate EOC would be valuable so this problem does not recur.

5. APPENDIX A: Previous Report (Sept. 2011)

Al MacDonald ,VA3TET, made the following recommendations to Deputy Chief Martin on **September 18, 2011.**

- 1 The Woolwich Administration Building and the Woolwich Recreation Center (both used as the emergency centers) are buildings that have been constructed with a metal shell. This metal envelope acts as a Faraday shield, hindering radio signals. Communications is further exacerbated by the Low E windows that do a good job of reflecting Infrared light and radio signals. This applies to both Amateur and regular service equipment.
- 2 As a result our 144 and 440 mhz. frequency signals are attenuated to the point that reliable communications are difficult. Proper cabling and a roof top antenna is the only way to ensure consistent communications. The exercise demonstrated and confirmed this requirement.
- 3 There needs to be an equipped common communications room for all emergency facilities. We are not familiar with the Woolwich Tsp. and Regional staff, and could not easily find an addressee, resulting in the delay of a timely message delivery.
- 4 Reliance on verbal messages will not maintain message integrity***. We observed that some messengers were using notepads with handwritten

messages on it. We suggest that pre-numbered message forms (in carbonless format) be available for all written communications. This would ensure that messages are delivered and easily tracked. The form should include provisions for message sent and received date and time.

*** Nov. 2014 additional note for 4: This issue may be addressed with the online software tested on Nov. 13, 2014.