

## **APPENDIX O – REVISED (SEPTEMBER 2010)**

The ESVA 9-1-1 Commission (working with the Communications Infrastructure Workgroup) is recommending these standards to position public safety users with future capabilities for the latest system technologies and interoperability as we move toward system upgrades and enhancements.

### **Eastern Shore of Virginia 9-1-1 Commission Mobile and Portable Radios Interim Procurement and Compatibility Guidelines**

- Mobile and Portable Radios Operating under the ESVA 9-1-1 Fire-EMS Frequency Plan are VHF models with frequency range coverage 146-174 MHz, with a peak requirement between 150 MHz and 160 MHz. Current radio operations are analog voice without data transmissions. Digital technology is not yet deployed, however may be in the future (pending mid and long range plans). The following specifications and example radios are based on expected future radio and radio system capabilities.
  - CORE/REQUIREMENTS - Mobile and portable radios need to be Narrowband capable (with the ability to operate in wideband or narrowband mode), MDC1200 compliant (or other accepted/approved radio signaling standard), P25 capable/compliant, have a 128 minimum channel capacity (in multiple modes/banks), have a display screen (with a minimum of twelve for character spacing to promote consistent nomenclature), include necessary ruggedness (military specifications), have “man-down” capability, and capable of tone and digital coded squelching (DPL).
  - New radios will be manufactured per FCC regulations and will meet the narrowband requirement. Radios will have the ability to operate analog core or digital format.
  - MDC1200 is the signaling standard adopted by ESVA 9-1-1 which allows for the encoding and decoding of a four-character assigned code in each radio, thus permitting the identification of a calling unit (radio user) by code or alias. It also permits the transmission and processing of the emergency “man-down” feature on compatible radios. If another signaling standard is used it must be approved/authorized by ESVA 9-1-1 (to verify ability to identify radio).
  - Continuous tone coded squelch system (CTCSS), also known as Private Line (PL), Channel Guard (CG), and other manufacturer nomenclatures is used to minimize audible interference by filtering out other system users on the same frequency through use of a sub-audible tone. Digital tone coded squelch, more commonly referred to as “Digital PL” or DPL, is a digital methodology which will be deployed within the ESVA 9-1-1 system to meet expanding filtering needs.
  - Narrowband capable refers to the FCC mandate that by January 2013 all public safety radios (VHF and UHF) will operate on 12.5 kHz or narrower channels.
  - APCO Project 25 (P25) is a set of standards that have open architecture, user driven suite of system standards that define digital radio communications system

architectures capable of serving the needs of Public Safety and Government organizations. The P25 suite of standards involves digital Land Mobile Radio (LMR) services for local, state/provincial and national (federal) public safety organizations and agencies. P25 open system standards define the interfaces, operation and capabilities of any P25 compliant radio system. In other words, a P25 radio is any radio that conforms to the P25 standard in the way it functions or operates. P25 compliant radios can communicate in analog mode with legacy radios and in either digital or analog mode with other P25 radios. The P25 standard exists in the public domain, allowing any manufacturer to produce a P25 compatible radio product. P25 capable radios will require future upgrade (to become P25 compliant) at additional costs.

- For future interoperability a minimum of 128 channels is considered a core specification. Most radios use channels in banks or zones of 16 channels each. Having additional zone capacity allows for more interoperability options and/or transitional program zones. However, as the complexity of programming is increased as is user training/understanding.
  - All radios should have a display screen to quickly access and channel or mode. The display should include a minimum of twelve for character spacing (to promote consistent nomenclature).
  - All radios should meet applicable military (ruggedness) specifications, including being able to withstand temporary and sustained environmental events, such as rain, humidity, and shock.
- Mobiles 45W, 128 Channel Minimum
    - **CURRENTLY UNDER CONSIDERATION** (Professional Public Safety Tier):
      1. Kenwood TK-5720 – (P25 Compliant)
      2. Kenwood NX-700 – must add MDC1200 board (P25 Capable)
      3. Visit VITA website for list of radios (meeting core requirements) currently on state contract.
    - Mobile Antennas
      - 3dB Gain Antenna (typical base coil and whip) if allowed by height
      - Unity Gain Antenna (short whip)
      - Low Profile Antennas only if height constrained
      - If unsure, ask for comparative specs and pros/cons
      - Remember that the antenna is a critical part of the mobile radio system which needs to be routinely checked to assure proper functioning
  - Portables 5W, 128 Frequency Minimum
    - **CURRENTLY UNDER CONSIDERATION** (Professional Public Safety Tier):
      - In addition to the MDC1200 signaling requirement, users may need to determine if a portable radio can decode Quik-Call II tones if the radio will be used to receive station pages (alerts) in conjunction with calls.

1. Kenwood TK-5220 (P25 Compliant)
2. Kenwood NX-200 – must add MDC board (P25 Capable)
3. Motorola XTS-1500 - ASTRO 25 (P25 Compliant) \*
4. Visit VITA website for list of radios (meeting core requirements) currently on state contract.

*\* Although the Motorola XTS-1500 is being considered/reviewed, it has only a 96 channel capacity – Listed to provide additional product selection at this point.*

- Be Sure Batteries Are In Good Condition
  - Motorola 3-Digit Date Code – “YWW” where Y equals year and WW equals week... i.e., 425 equals 25th week of 2004... batteries 3-5 years old are candidates for replacement if not functioning well
  - Other batteries (non-Motorola) typically have a date code available
- Programming of Radios
  - ESVA 9-1-1 maintains programming capabilities for most Motorola radios.
  - ESVA 9-1-1 programming vendors provide programming for most Motorola and Kenwood radios.
  - While programming is the responsibility of the radio owner, ESVA 9-1-1 will assist when possible.
  - For new radio orders, ask ESVA 9-1-1 if a “codeplug” exists that can be modified and copied to your new radio. This will provide standardization of radios at least for the basic operations. Additionally, assure that an MDC code is assignable to your radio and matched to a console alias (unit name). The codeplug can be sent to your dealer for programming your radio.

## OTHER

1. These standards are designed to provide guidance and recommendations for immediate purchases of radios that may be necessary by the several stations. It should be understood that in the future (as additional radio infrastructure options are explored), these guidelines and recommendations may change.
2. Any requests or proposals to add, delete, or otherwise change any of the above radio recommendations and guidelines should be brought to the attention of the 9-1-1 Commission, through the 9-1-1 Director.