

## ***Paging White Paper and Work Group Request (David Buchanan)***

### *Public Safety Needs Paging Capabilities*

Currently, many public safety agencies have a need for paging services. Public safety paging traditionally has used tone and voice technology. The other primary paging technology is digital paging giving numeric or alphanumeric message readouts on a display built in to the pager. One primary use is alerting of fire personnel for dispatch to a fire. Using tone and voice paging, each agency combines paging with voice dispatch on the same channel. Many new public safety paging systems are implemented with digital paging technology.

As agencies migrate to trunked systems the traditional tone and voice paging cannot migrate. The conversion to narrowband below 512 MHz is also impacting traditional paging. No tone and voice pagers using Project 25 Digital modulation are available. Tone and voice pagers are more expensive than alphanumeric pagers, roughly \$350 vs. \$100 per pager. These factors will force changes to traditional public safety paging methodologies.

### *Types of Paging Technologies*

An alternative to tone and voice paging is digital paging, either numeric or alphanumeric. Numeric pagers simply give a series of numbers in their display when paged. These normally are telephone numbers input to the paging controller by the person initiating the page. The numbers can also represent a code, as example, adding 911 after a telephone number would mean emergency. Alphanumeric pagers can receive a text message sent via a computer to the paging controller. The paging controller receives messages to send out through a modem or by direct connected computers. By writing a program, email can also be used to input messages to the paging controller. In addition, Computer Aided Dispatch (CAD) systems with special programs will send messages to a paging controller. This allows the sending of automated messages that dispatch units to an incident.

There are advantages and disadvantages to both methods of paging in public safety service. Certainly, commercial systems use alphanumeric digital paging exclusively. This is due to the spectrally efficient nature of the digital format. Many thousands of pagers can operate on a single channel. Tone and voice paging systems typically can support less than 100 hundred pagers assuming each pager has individual alerting.

For public safety usage, tone and voice systems allow paging on a dispatch channel. This offers personnel the option to monitor their dispatch operations with the pager in monitor mode. However, the tone and voice format supports only limited numbers of individual paging codes. The relatively large amount of airtime required to send a voice message also limits the number of pagers supported on a channel.

Alphanumeric pagers can store messages, allowing personnel to review messages if they forget the contents. This along with the ability to connect CAD systems to the paging controller provides an automated alerting function. The paging controller also provides priority levels for pages. Using this function, priority dispatch pages go to top of cue and immediately sent. Each pager can have up to four or more alerting codes. So individual paging plus group paging is possible. Digital paging systems can support many agencies on the same system. Using priority features of the paging controller, critical dispatch pages will be sent with minimal delay. Implementing shared systems reduces the cost per pager to build and operate the system. The primary disadvantage to alphanumeric paging is the loss of monitoring of the dispatch channel. Another possible enhancement is two-way paging. With two-way paging dispatch centers can get a positive response back from each pager giving status or a short message. Even limited mobile data functions such as driver's license checks or AVL are possible. This would make a good tool for public safety even better.

The more advanced commercial paging systems offer two way paging. This allows short text messages or auto reply messages to be sent back to the paging controller by a pager or for a pager to send a message to another pager. This technology requires a second frequency to allow inbound messages from the pager.

Two trends in deploying public safety radio systems impact the current use of tone and voice paging systems. First, many agencies have migrated to the 800 MHz band and use trunked radio technology. Second, as systems below 512 MHz transition to narrow emissions to meet FCC refarming rules, agencies are electing to implement using digital modulations. Both of these trends impact the ability of agencies to retain their traditional tone and voice paging systems.

Another trend to consider is the growth of cellular phone use. While a few years ago, commercial paging systems were a large growth area, commercial systems have lost large numbers of paging customers. This is a direct result of the huge growth in cell phone use.

Because of the smaller market for paging, some paging companies have quit the business and others have merged. Due to this industry consolidation, apparently many 900 MHz paging channels are unused today. While more technical and licensing research is needed to better quantify and document the usage of 900 MHz paging channels, the trend creates an opportunity for the public safety community to request the FCC to allocate some 900 MHz paging pairs of frequencies for public safety use.

#### *Need for a NPSPAC Working Group to Address Paging*

Based on the above, it is clearly time for NPSTC to form a Paging Working Group, under the NPSTC technology Committee. The following Mission and Charter Statements are proposed for NPSTC approval of this new Working Group:

### Mission

*This working group will focus upon ensuring that NPSTC properly addresses public safety requirements for paging capabilities. It will also address how Technologies and Spectrum allocations can address these needs.*

### Charter

*Immediate goals of the working group include:*

- 1. Documenting public safety paging requirements, including the paging needs of various groups such as Police, Fire, EMS, and other Government services*
- 2. Identification and tracking of Paging technologies, including defining markets and tracking obsolescence schedules.*
- 3. Advocating public safety spectrum allocations for paging, consistent with technologies available to serve larger markets*