

# The Police Chief

THE PROFESSIONAL VOICE OF LAW ENFORCEMENT

DECEMBER 2008

## ACHIEVING COMMUNICATIONS INTEROPERABILITY IN CENTRAL VIRGINIA: The COMLINC Project

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When experiencing an emergency situation, citizens expect their calls for service to be answered and handled in the most expeditious and professional manner possible. The general public does not worry if emergencies occur in overlapping jurisdictions; people simply want to know that their situation will be handled properly. This proper handling of emergencies must be a primary consideration when public safety leaders strategically plan how best to deliver service. Agencies can rest assured that individuals calling 9-1-1 will not be interested in explanations that the equipment is too difficult to use or that jurisdictional boundaries prevent the agency from properly handling the emergency or that one locality has 800-MHz radios and the other has VHF radios. These callers expect public safety agencies to provide emergency assistance effectively and efficiently. After debriefing many incidents, the Lynchburg Police Department has concluded that there is a necessity and importance to the delivery of seamless emergency services.

Bearing in mind that agencies sometimes fall into the trap of narrowly focusing on their own needs at the expense of interdisciplinary and/or regional needs, police leaders must often remind themselves and each other to slow down and examine the "big picture." Systems designed to support the unique needs of each agency unfortunately create disparity across jurisdictions, which hampers the ability of agencies to work together. For example, if one police department issues .40-caliber pistols and another depart-

ment issues 9mm pistols, then ammunition is not "interoperable" between these two agencies. If one emergency medical service (EMS) team is operating on an 800-MHz trunked radio system and another EMS team from another jurisdiction, operating on a UHF frequency, arrives to assist, are their communications systems interoperable? For this reason, the design and implementation of a communications system that provides seamless interoperability among agencies with disparate equipment can be quite complicated.

### Value for Critical and Common Incidents

Over the past several years, there have been tragedies and disasters of great magnitude where more effective communications would have been helpful. The unthinkable massacre at Virginia Tech University on April 16, 2007, is an example of a critical incident where interoperability was crucial to effective response. One of the recommendations of the report issued by the Virginia Tech Review Panel was the establishment of "a countywide emergency medical services, fire, and law enforcement communications center to address the issues of interoperability and economies of scale."<sup>1</sup> It is hoped that such a senseless tragedy will never occur again; however, if a similar incident does happen, this interoperability solution will allow more efficient and effective communication in any emergency or critical incident involving multiple jurisdictions or disciplines regardless of the radios issued to the first responders.

It is important to stress that this technology will be wasted, however, if agencies

implement this communications interoperability solution only to shelve it until the "big one" comes along. This communications solution certainly would have been very effective during the tragic terrorist attacks of September 11, 2001, for example, but it is also useful during a vehicle pursuit that crosses a county line or at local special events such as athletic competitions or visits from presidential candidates.

### Interoperability in Central Virginia

In an effort to enhance the effectiveness of public safety communication systems and to resolve interoperability shortfalls in the Lynchburg, Virginia, and the Roanoke, Virginia, metropolitan service areas (MSAs), the City of Lynchburg and the City of Roanoke received funding from the fiscal year 2005 Interoperable Communications Technology Grant provided by the U.S. Department of Justice, Office of Community Oriented Policing Services (COPS) toward improving the interoperability of local agencies' communications systems. Furthermore, the Virginia Department of State Police contributed the required matching funds for this grant program—another example of the strong partnerships that help such projects achieve success. The Lynchburg MSA has a population of approximately 240,000, and the Roanoke MSA has a population of about 290,000. Area authorities began to implement their chosen system, known as the Virginia Commonwealth Link Interoperability Communications (COMLINC) system (see figures 1 and 2), in 2005 and will complete the system by the end of 2008.

1. Augusta County	10. Appomattox	19. Franklin	28. Mecklenburg
2. Greene County	11. Bedford	20. Montgomery	29. Halifax
3. Buckingham	12. Campbell	21. Roanoke	30. Virginia State Police (VSP) headquarters
4. Farmville Town	13. Charlotte	22. Roanoke City	31. VSP Division 3
5. Nelson County	14. Cumberland	23. Salem	32. VSP Division 6
6. Prince Edward	15. Liberty University	24. Vinton City	33. Fluvanna
7. Staunton Town	16. Lynchburg	25. Patrick	34. Virginia Tech University
8. Waynesboro	17. Botetourt	26. Charlottesville	
9. Amherst	18. Craig	27. Henry	

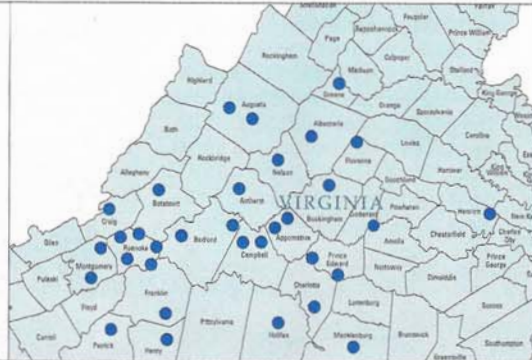


Figure 1. COMLINC interoperability sites

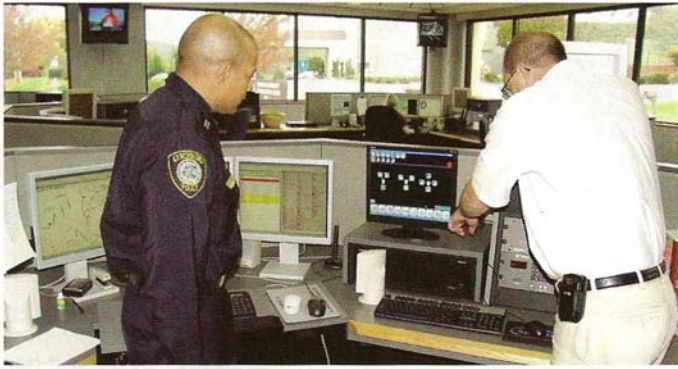


Figure 2. Captain A. S. Thomas of the Lynchburg Police Department and William Aldrich, director of the Lynchburg Emergency Communications Center, discuss the features of the new RIOS client on Lynchburg's dispatch consoles.

The time and effort expended to make this project a success demonstrate the complexity of communications interoperability. Using a competitive solicitation process, project administrators selected SyTech Corporation's Radio Inter-Operability System (RIOS) over numerous systems due to the maturity of the system, its operational features, and its competitive pricing. When implemented, the COMLINC system will connect 34 jurisdictions (see map in figure 1), providing them with the ability to communicate and share information seamlessly.

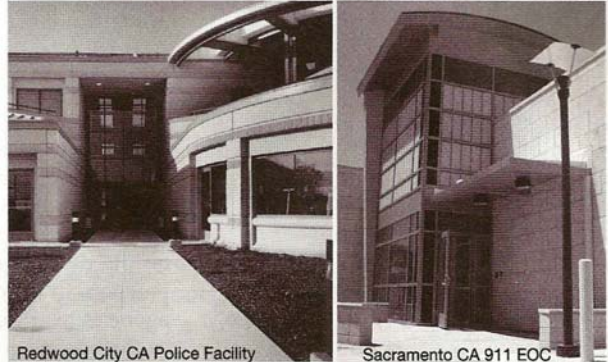
This exciting interoperability solution will benefit local, county, state, and federal law enforcement agencies; universities; fire departments; schools; and public works and rescue squads. As previously stated, all of a jurisdiction's public safety agencies must be able to communicate to deliver timely and effective services to residents. Each public safety entity is a team member responsible for a segment of service that can

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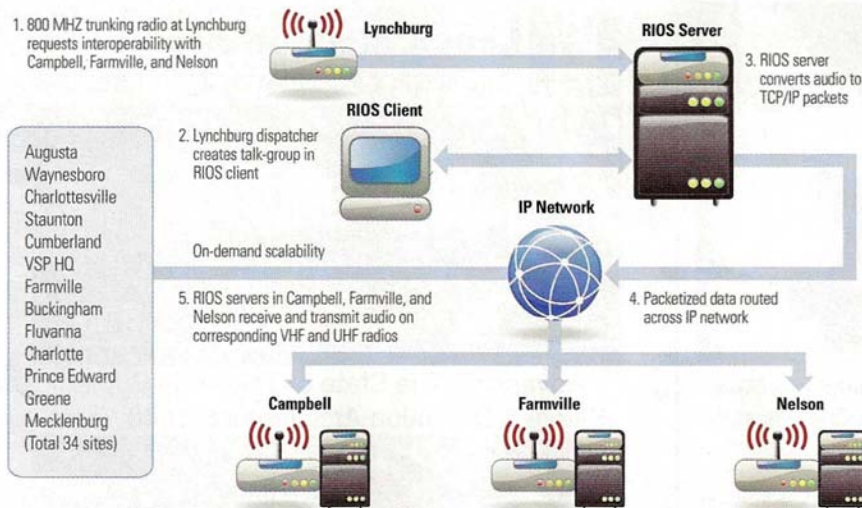


Figure 3. RIOS command and data flow

be delivered properly only through well-established partnerships.

#### How COMLINC Works

A major benefit of the COMLINC system is that it uses existing radio systems. Connections between counties are made using Voice over Internet Protocol (VoIP). The RIOS supports the base station as well as mobile and portable radios in use throughout the counties. These various radios are controlled through use of tone,

direct current, and even ear and mouth. At numerous digital trunking sites, wild-card talk groups have been established on the dispatcher consoles to enable dispatchers to make connections with other agencies or counties.

See figure 3 for a description of the command and data flow when the operator completes a "patch" between multiple sites.

It is vital that public safety agencies respond to incidents quickly, with the

proper personnel and equipment. For this reason, interoperability systems must be user-friendly and intuitive. The RIOS graphical user interface (GUI) requires only three clicks of the mouse: once to select the function, a second time to select the radios to be patched, and a final time to confirm. Figure 4 is a display of the RIOS GUI.

#### Significant Cost Savings

Public servants must use taxpayer dollars in the most cost-effective way possible. The Virginia COMLINC project has proved to be a major success at a small fraction of the cost it would have taken to upgrade all 34 participating jurisdictions with a trunking system. A conservative estimate is that an 800-MHz trunking system to service all 34 COMLINC sites in central Virginia would have cost upwards of \$100 million. Using the COPS grant, radio and data interoperability will be established in these jurisdictions for less than \$3 million. The use of Internet and microwave connectivity along with VoIP technology within the SyTech RIOS is an extremely cost-effective method of achieving full and total voice, data, and video interoperability. Indeed, this technology could be extended throughout the United States at a fraction of the projected cost for achieving full and total interoperability within the next five years.

## Conclusion

Today, more than ever, citizens expect collaborative public safety services. This collaboration includes local, state, and federal authorities in police, fire, and emergency medical services. Interoperability enables agencies to work together toward a common goal, and the main focus of this concept for the law enforcement community is in communications.

In continuing to advance the delivery of public safety services, the law enforcement community must always capitalize on cutting-edge technology. The Lynchburg and Roanoke MSAs will continue to upgrade their respective radio systems as well as the RIOS itself to maintain voice, data, and video interoperability in the future.

For more information, readers can contact the authors at [H.Wayne.Duff@lynchburgva.gov](mailto:H.Wayne.Duff@lynchburgva.gov) or [garmen@sytechcorp.com](mailto:garmen@sytechcorp.com).

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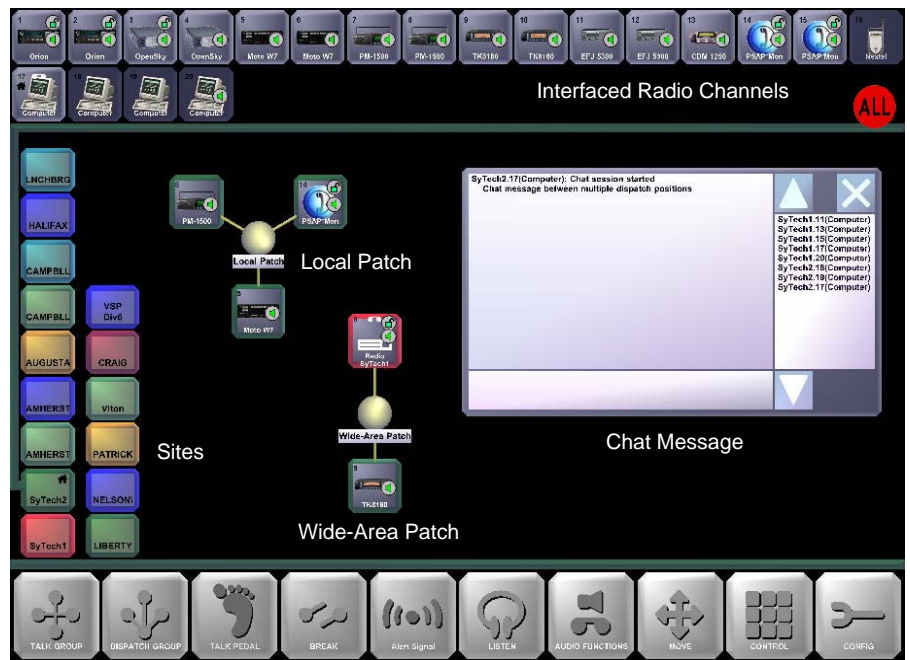


Figure 4. The RIOS graphical user interface for the COMLINC system. In this view, a local patch among radio channels and a phone line is shown above while a wide-area patch between neighboring tone-controlled radio systems is shown below it. A chat message is initial among multiple positions to communicate the requests of the wide-area patch. In this arrangement 15 of the 34 sites are shown in the GUI's site column on the left.

### Note:

Virginia Tech Review Panel, "Emergency Medical Services Response," chap. 9 in *Mass Shootings at Virginia Tech, April 16, 2007: Report of the Review Panel*, August 2007, <http://www.scribd.com/doc/265934/Virginia-Tech-Shootings-Review-Panel-Report-16-CHAPTER-IX> (accessed October 30, 2008), 122.

The text positioning of this document is arranged to reduce file size and increase readability. Figure 4 is an updated COMLINC GUI compared to the original graphic of the original publication.

For more information on RIOS please visit [www.SyTechRIOS.com](http://www.SyTechRIOS.com) or contact Gil Armendariz at [garmen@sytechcorp.com](mailto:garmen@sytechcorp.com)