Application Note
IPR100

SCHOOL DISTRICT USES IP TO ESTABLISH MULTISITE REPEATER NETWORK

Customer Profile

- A large municipal school district using radio for campus security, maintenance, transportation, IT, sports and general district operations.

Application

- Information required to be shared over multiple repeaters for wide area coverage

Business Benefits

- Low capital cost
- Cost savings by replacing leased lines with existing IP infrastructure
- Payback for the entire system purchase, including all radios, repeaters and IPR100's less than a year
- Single box solution for Radio to IP conversion including PL tone detection and generation
- Communications reliability improved by sending PL tones (CTSS) as data rather than audio

Products Used

- IPR100

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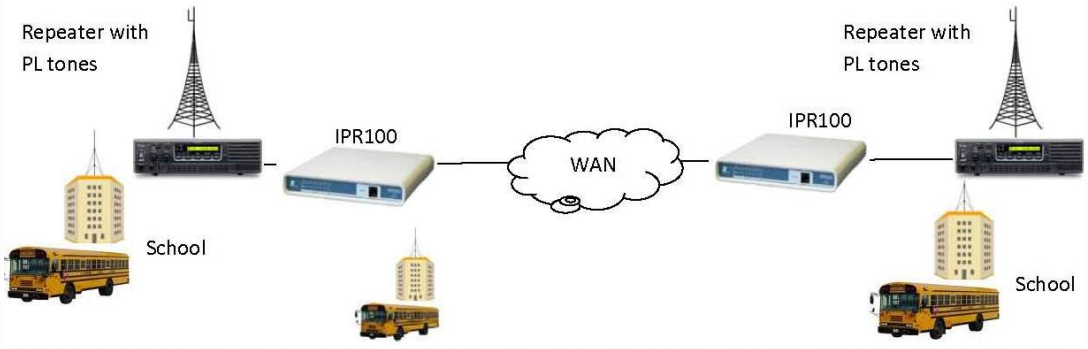
➢ Overview

A large municipal school district utilizes 2 radio repeaters to cover a number of schools in the district. The radio network is used by campus security, maintenance, transportation, IT, sports, and for general district operations. Additionally, a repeater link to access 911 for emergency calls is provided to all users. The majority of voice traffic is local to its own repeater but occasionally voice traffic needs to be broadcast over both repeaters to provide full district coverage. Users are supplied with handhelds and mobiles capable of supporting multiple PL (CTCSS) tones. The radios use multiple channel positions on the same frequency to select different PL tones. Based on the programming in the IPR100, radios and repeaters, a user may access radios from his or her own or other district departments and calls are automatically routed to either the local repeater they are using to access the system, or to both repeaters for wide area coverage. The choices are programmed into the radios with alpha-numeric tags, making for simplified user operation.

The capital cost of adding a UHF link was prohibitive and the ongoing leased line cost was going to be an ongoing burden. Since the school already had a wide area network available throughout its coverage area, radio over IP was the logical choice.

School District wide area radio coverage using IP



➢ The Challenge

A single frequency pair is used at each repeater with multiple PL (CTCSS) tones. These can be used to path steer audio from the local repeater or include the remote repeaters.

➢ Solution

Add an IRP100 at each repeater and use the CTCSS tone detect option. When the receive audio from the local repeater is combined with the correct PL (CTCSS) tone the audio is sent to the remote repeater via the IP network. The PL tone will cause the remote repeater to key up and re-broadcast the audio. The remote repeater will have similar functionality to key up the local repeater. The fast keying option can be used to reduce the delays of recognizing the PL and then keying up the transmitter.

➢ Conclusion

The application requirement was met with a cost effective solution. The ongoing costs were nil as the client already had an IP network. The solution was simple to implement and install and didn't require network reprogramming. The local detection of the PL tone and then transmitting this as IP data added to the reliability of the solution.

Thanks to John Coupe and Coupe Communications for providing a reliable innovative solution for another client.