

# BCSL and Motorola Support Distributive Education in Belize

Belize



## Customer

The Caribbean Centre of Excellence for Teacher Training (CCETT) Program, currently operating in Belize, Jamaica, St. Lucia, St. Vincent and Guyana in the Caribbean and Central America, creates a network of professionals from selected primary schools, teachers' colleges, and the Regional and District offices of the Ministries of Education. The program trains teachers in reading instruction, with a commitment to improving educational achievement among students. The teachers learn participatory educational methodologies, alternative instruments for measuring progress and strategies for engaging parents in the educational process. The long-term goal includes training 5,000 teachers from 12 countries in the region.

In Belize, teachers from five schools – Burrell Boom Methodist, Central Christian, Guadeloupe Roman Catholic, Salvation and Saint Luke's – are focusing on language fluency, writing and developing vocabulary.

## Solution Provider

Established in 1988, Belize Communication & Security, Ltd. (BCSL) is the oldest land-mobile wireless radio provider in Belize. While providing wireless radio connections in Belize, BCSL also serves markets outside Belize and specializes in site surveys, installation and maintenance of wireless products for networks, wireless security

cameras, last-mile connectivity and alternative energy monitoring. BCSL has more than 80 years of combined associate experience and is an authorized U.S. government contractor.

## The Situation and Challenge

School systems are similar to corporate mergers in that standardizing programs and communications among multiple sites presents a major challenge. Remote schools are sometimes left on their own to develop home-grown programs. For the most part, support and training in these remote schools are available only if the teachers are able to travel to populated areas that house the main facility of the educational system. When there are only a few teachers in a school, having one teacher absent, even for a short time, is a problem. In some areas, telephone service is limited, eliminating teleconference training as an option.

Through the University of Belize and in cooperation with the University of the West Indies, CCETT wanted, as a first phase, to connect primary schools to the wide-area network at the University of Belize in order to expose teachers in remote areas to the latest teaching skills and, among other tasks, create a database to assist in measuring the effectiveness of the program. To carry the distance-learning applications, the University of Belize needed high-speed connectivity to participating schools.

*“After being exposed to the Motorola PTP 400 Series I now know why patched-together systems have not worked before. The technology, dependability of equipment and the people of Motorola’s PTP Wireless Group truly have made the difference.”*

~ Rick Simpson, President, Belize Communication & Security, Ltd.

As with most Central American countries, underground fiber optic cable in Belize is not a practical alternative. Fiber is extraordinarily expensive (up to four times the cost of fiber in developed countries), and it only follows mainstream communication avenues such as roads and power lines.

Wireless connectivity seemed a likely solution, but while some schools are located closer to the University, others are located outside the metropolitan area, requiring links up to 20 miles (32 km). Within the city, tall buildings and mature tropical trees provided challenges for line-of-sight communication. For rural locations, distances, non-line-of-sight issues and inadequate mounting platforms were the primary challenges. Finally, building a wireless network in a tropical environment is in itself a daunting task. Trying to install towers, masts, radios and conduct alignment is difficult when relentless rain, as much as three inches (seven cm) an hour, will sap the energy of the most experienced engineer or installer.

#### **Technical Requirements**

- Feasibility survey of wireless connectivity
- Tower structures as high as 100 feet (30 meters) for mounting high-gain antennas and radios
- Combination of “shots” – short, long, and sometimes requiring relays
- Lightning protection, a paramount concern in the tropical climate
- Sufficient bandwidth and throughput speed to reliably carry heavy-duty distance-learning applications to remote schools

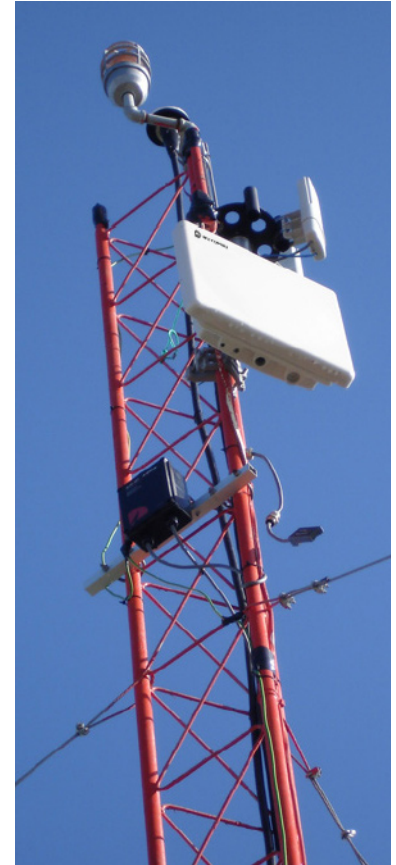
#### **Deployment Detail and Interoperability**

It was determined early on that the Motorola Point-to-Point Wireless Ethernet Bridges – 400 Series with integrated antennas offered the best solution, meeting the bandwidth and speed requirements as well as allowing for future expansion. Where possible, BCSL technicians erected radios and antennas on existing structures. The PTP 400 Series unit at the University’s main facility required a 30-foot (nine-meter) tower on top of a two-story building. The receiving end was mounted on a 100-foot (30-meter) tower in a schoolyard, with elevated anchor points and buried cable to remove any risk to students and school personnel. Motorola’s Lightning Protection package was deployed to guard against lightning damage in the storm-prone climate.

#### **The Results**

The Motorola point-to-point wireless network covers more than 50 miles (80 km), connecting the University of Belize and its WAN to six primary schools. The 10-15 Mbps throughput allows the schools to experience fast response and two-way data and video communication, delivering distance-learning programs and communications throughout the Caribbean, with the promise of similar connectivity within other countries participating in the CCETT program.

Most important, the interactive capability provided by the network allows both students and teachers to experience and learn from other schools and universities, which brings the world to the front door of rural schools.



At the time of this installation, the products deployed were the Orthogon Systems OS-Gemini point-to-point wireless Ethernet bridges. With Motorola’s acquisition of Orthogon Systems, the OS-Gemini products were renamed as the PTP 400 Series bridges. They are now part of Motorola’s **MOTOwi4™** portfolio of innovative wireless broadband solutions that create, complement and complete IP networks. Delivering IP coverage to virtually all spaces, the **MOTOwi4** portfolio includes Fixed Broadband, WiMAX, Mesh and Broadband-over-Powerline solutions for private and public networks.

**MOTOwi4™**

### Why Motorola?

- The “human factor” – Motorola’s engineers and hands-on marketing personnel speak both the layperson’s and the IT person’s language
- Motorola PTP Link Estimator, which made it easy to predict how links would perform under specific path conditions
- On-board software, audio signal and educational documentation, which promote easy setup, alignment and maintenance
- Quality equipment and self-managing operation, delivering a highly reliable, robust, long-distance connection, especially important for remote areas
- Easy, cost-effective expansion to other remote sites

### About Motorola

Motorola is known around the world for innovation and leadership in wireless and broadband communications. Inspired by our vision of Seamless Mobility, the people of Motorola are committed to helping you get and stay connected simply and seamlessly to the people, information, and entertainment that you want and need. We do this by designing and delivering “must have” products, “must do” experiences and powerful networks – along with a full complement of support services. A Fortune 100 company with global presence and impact, Motorola had sales of US \$36.8 billion in 2005. For more information about our point-to-point products and services, visit our website at [www.motorola.com/ptp](http://www.motorola.com/ptp).



**For more information about the Motorola Point-to-Point Solutions:**  
**Outside of North America:** +44 1364 655500  
**In North America:** +1 877 515-0400  
**[www.motorola.com/ptp](http://www.motorola.com/ptp)**

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