



# Motorola's Ultra-Long-Distance PTP Solution Contributes to Xinjiang Mobile's Village Phone Project

Xinjiang Province, China



In Aqiang village, the PTP 400 Series bridge was installed with a dual-polarized antenna, 65 feet (20 meters) high.

There are still areas of the world so remote that they have no Internet access, and sometimes no communications at all with the outside world. The Xinjiang Autonomous Region in China is one such area, known for its harsh climate, vast stretches of desert and poor economic conditions. Traditional fiber and even more contemporary microwave networks just can't handle the rigors of the region. But Motorola's PTP 400 Series bridges deliver a whole new world of information over robust wireless broadband.

## Customer

Aqiang village is located in Bazhou, part of China's mountainous Xinjiang Autonomous Region that is infamous for its harsh geographic and economic climate. The lack of communications in the area has hindered economic development and any possible improvement in living standards. As a result, many of the indigenous farmers and herdsman are still living under the poverty line.

## Service Providers

ROOTS Communications and Xinjiang Ying Sheng Information Technology jointly worked on the Xinjiang project.

Founded in 1997, ROOTS Communications has established itself as a reputable and reliable provider of telecom engineering services and value-added solutions in the Asia-Pacific region. The company's three main business focuses – testing and measuring, wireless engineering and wireless systems – deliver a comprehensive suite of solutions to major carriers, multinational corporations and other enterprises. ROOTS is headquartered in Singapore with subsidiaries in China and Malaysia.

Xinjiang Ying Sheng Information Technology Co., Ltd., a value-added reseller, specializes in integrated communications products, sales and service. Keeping pace with China's rapid development in telecommunications, the company has launched market demand for new products, particularly in signaling test instrumentation, mobile communications and wireless LAN products.

### Situation and Challenge

To bring communications to villages across China, the Ministry of Information Industry started the Village Telephone Project. China Mobile Corporation identified Xinjiang as one of the 25 key provinces to benefit under this project. The local subsidiary, Xinjiang Mobile, then pledged its commitment to eliminate the “lonely island of information” and bridge the “information gap” for the people in the area by extending the GSM mobile communication coverage to rural areas where telephone networks are not yet established.

However, in order to establish interconnection between the base station in Aqiang village and the base station controller in the county seat of Qiemo County, Xinjiang Mobile had to construct a transmission line between the two, a line capable of handling high-speed transmissions – comparable to two to four T1/E1 lines – across long distances and open space.

The unique climatic and geographical conditions of the Bazhou region pose severe challenges for the Village Telephone Project. A 56-mile (90-km) stretch of the Taklimakan Desert separates the base station controller in Qiemo County from the base station in Aqiang village, presenting some difficulties in implementation. Potential solutions such as fiber optic cable or traditional microwave transmission have limitations. Fiber installation is a difficult, lengthy and expensive process, while microwave is unable to achieve long-distance transmission without additional relay stations, also a costly and complicated project. In addition, the danger of path-fading in the desert means that diversity must be achieved through the addition of antennas with diameters of more than 10 feet (three meters), which in turn would increase the wind resistance of the antenna, requiring that the tower be fortified to withstand the wind. Thus, these alternatives would only increase the cost and complexity of the project.

### Technical Requirements

- Ability to deliver communications over long distances and wide-open terrain without path-fading
- High-speed transmission equal to multiple T1/E1 lines
- Controlled investment costs for tight budget

### Deployment Detail and Interoperability

Confronted with these challenges, telecomm partners ROOTS Communications and Xinjiang Ying Sheng Information Technology Co., Ltd., proposed Motorola wi4 Fixed PTP 400 Series Wireless Ethernet Bridges, Connectorized models with external antennas. With superior anti-fading and long-distance transmission capabilities, the Motorola PTP solution effectively guarantees a higher quality of communication at a low cost.

The system was deployed on September 28, 2006, after two days of installation and testing. Line-of-sight communication between the two ends was established across 56 miles (90 km) of open desert. At the Quiemo County base station controller, two 2-foot (0.6-meter) monopole antennas with 28 dBi gain were installed with the PTP 400 Series bridge. The antennas are spatially diversified and sit 118-131 feet (36-40 meters) above the ground. The Indoor Unit (IDU) uses the Ethernet MUX 504 T1/E1. In Aqiang village, the PTP 400 Series bridge was installed with one 0.9-meter dual-polarized antenna with 31 dBi. The antenna is 65 feet (20 meters) high, and again the IDU uses the Ethernet MUX 504 T1/E1.

### Results

With the antenna adjusted to its optimum direction, transmission achieves a maximum speed of 24.4 Mbps. In addition, the Ethernet MUX 504 T1/E1 integrated wiring cabinets provide 4x T1/E1 transmission. The maximum net rate of the PTP 400 Series bridge reaches 43 Mbps, which more than enables it to meet the requirements set by the Village Telephone Project.

Now, via wireless communication, the people of Aqiang village are able to connect to the world outside their locality for the first time. The practicality of the system also means that the base station can tap on all the telephone traffic channels, meeting the region's requirement for backbone network bandwidth. At the same time, the Motorola PTP wireless connection also ensures that Aqiang village's base station can access the backbone network without any difficulty.

### Why Motorola Point-to-Point Broadband Wireless Solutions Group:

- Long-distance transmission without fading and with high stability, up to 99.999% availability even across desert areas and in harsh environments
- Easy installation and high environmental adaptability, including the small-caliber antennas, which offer relatively low wind resistance
- Low investment and high return, allowing operators to meet the needs of end-users



The PTP 400 Series solution resists signal path-fading, even over the 56-mile (90-km) stretch of the Taklimakan Desert in the Xinjiang Autonomous Region

#### **MOTOwi4™**

The Wi4 Fixed PTP 400 Series Wireless Ethernet Bridges are part of Motorola's MOTOwi4 portfolio of wireless broadband solutions and services that help customers improve communications, increase efficiency, and enhance customer and public service. Delivering IP coverage to virtually all spaces, the MOTOwi4 portfolio includes Fixed Broadband, WiMAX, Mesh and Broadband-over-Powerline solutions for high-speed connectivity over private and public networks.

#### **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 connect 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 \$42.9 billion in 2006. For more information about our company, our people and our innovations, please visit [www.motorola.com](http://www.motorola.com).



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