

## A New View of Chama Yard

By: Jason Rose

During the early afternoon of September 25, 2012, the Chama web cameras came to life. Months of preparation and hard work covering several Work Sessions culminated in three very happy men staring transfixed at the images on a laptop computer in the old Log Bunkhouse. We simply couldn't wait to share this with the world!

The story began more than a year prior to that moment when discussions for mounting streaming-video web cameras in Chama started. The biggest hurdle was, naturally, the finances needed to purchase not only the cameras, but also the network hardware capable of transmitting an HD quality image 1,000 feet through the yard to the depot's internet connection. Several members of the Friends came forward and supplied the pile of money that was needed. We would love to give their names in hopes that everyone reading this article would personally thank them for such a generous gift, but they all wish to remain anonymous.

Board member John Engs has past experience with high-end professional-quality web cams and a type of wireless network technology that could be used to accomplish this mission. Assuming the role of Team Leader, he began putting a plan together and assembling the necessary components. His professional connections afforded him opportunities to purchase items at substantial discounts, allowing the allotted finances to be stretched far enough to build some redundancy into the system.

The cameras themselves were really the easiest component. The hard part was getting the signal from the cameras to the internet. Given that the rail yard in Chama is quite historic, every effort had to be made to minimize the visual impact of the various devices. John made the decision to construct a Firetide Mesh-node Network using directional radio antennas.



Using professional quality wireless technology allowed us to bypass the labor-intensive and visually-intrusive task of running coaxial or Cat5 cable between the coal tipple and the depot.

With all of the equipment purchased, the initial team (consisting of John Engs, Joe Kanocz, and Jason Rose) arrived for Work Session C in mid-June. The first thing we did after the morning safety briefing was unpack the pile of boxes waiting for us in the Log Bunkhouse. The learning curve was steep and involved some quick reading and several long phone calls to Firetide Technical Support, but after 3 days the software was installed and licensed and a rudimentary network was successfully built in the Bunkhouse.

[Editor's note: It needs to be mentioned that this cutting-edge technology was being worked on inside a log house constructed in December of 1880 when the Denver & Rio Grande Railroad arrived in town. It's believed to be the oldest structure standing in Chama. The juxtaposition of this really struck me. One day, while on the phone with tech support, the evening train arrived and I was able to share the moment with the tech who was equally amazed at what we were doing and where we were doing it. –Jason]

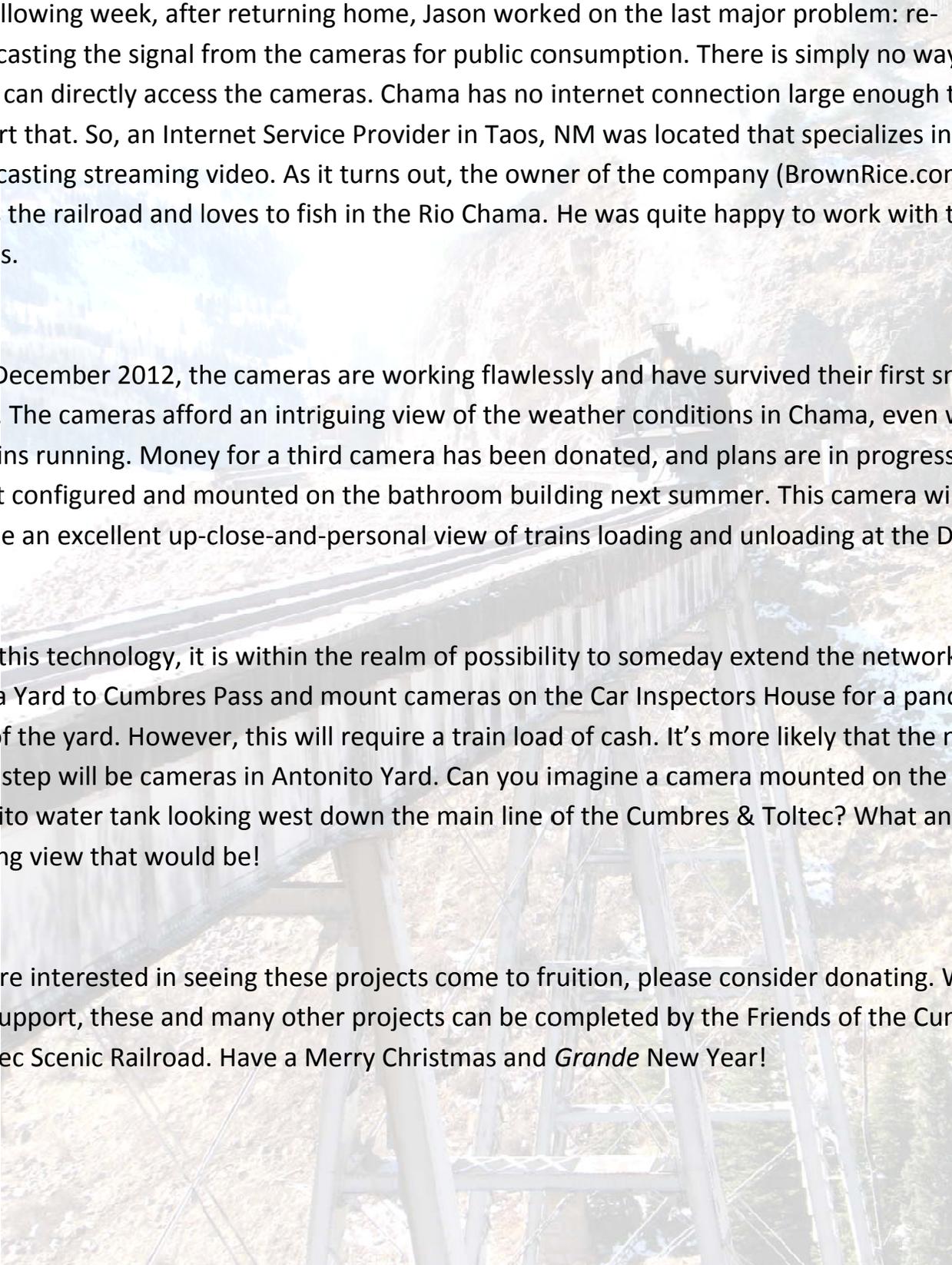
While playing phone-tag with tech support to get the initial lab built, Joe and Jason worked with John to get the details ironed out on where to install the Firetide nodes and antennas. The original plan called for mounting the antennas on the north side of the Depot for line-of-sight to the Bunkhouse and Coal Tipple, which would be the other two legs of the network. We quickly realized how visually intrusive this would be and made alternate plans to run PVC pipe with Cat5 cable from the Depot to the bathroom building where the antennas would be mounted instead. Digging the trench required a day and a half of unplanned work for Joe and Jason. This situation, combined with the fact that a few essential components were on back-order, ensured that this project would stretch beyond the time allotted.

At the end of Work Session C, all three Firetide nodes and their antennas had been assembled, tested, and labeled for easy installation later in the year. PVC conduit had been laid between the Depot and bathroom building to get the internet connection from the Depot's router to the Firetide node in the bathroom building, where it would then be broadcast through the air to the Bunkhouse and Coal Tipple. Also, the node and antenna mounts were bolted to the south side of the Bunkhouse.

During Work Session D, Joe and John pulled the Cat5 cable through the new conduit and capped the ends. Joe also worked on running power to the bathroom node. Bob McCain and Marshall Smith joined the team and ran power to a relay box on the Coal Tipple for the cameras and Firetide node. Bob and Marshall also ran and mounted all of the necessary conduits on the Tipple.

In late September, Joe, John, and Jason returned for a special Work Session with the goal of completing the project. Steve Forney, with his extensive background in RF technology, stepped in to assist as a consultant. Work progressed quickly with only one call to Technical Support. On Tuesday morning, with the antennas and nodes mounted, the Mesh Network went live. Some fine tuning and antenna alignment was needed, but all three legs of the network were working! The primary leg is between the Tipple and bathroom building. There are also legs between the Tipple and Bunkhouse and Bunkhouse and Depot. This puts a high-speed internet signal in the Bunkhouse for the Friends to use and it provides an alternate/redundant path for the cameras to broadcast to the internet.

After lunch on Tuesday, the cameras were mounted and powered up. Without a single glitch, the cameras began transmitting images and it was a sight to behold! Wednesday and Thursday were spent cleaning up the initial installation, weather-proofing cables, and constructing permanent housings for the cable and power junctions.



# Rio Grande Explorations

The following week, after returning home, Jason worked on the last major problem: re-broadcasting the signal from the cameras for public consumption. There is simply no way the public can directly access the cameras. Chama has no internet connection large enough to support that. So, an Internet Service Provider in Taos, NM was located that specializes in re-broadcasting streaming video. As it turns out, the owner of the company (BrownRice.com) knows the railroad and loves to fish in the Rio Chama. He was quite happy to work with the Friends.

As of December 2012, the cameras are working flawlessly and have survived their first snow storm. The cameras afford an intriguing view of the weather conditions in Chama, even with no trains running. Money for a third camera has been donated, and plans are in progress to have it configured and mounted on the bathroom building next summer. This camera will provide an excellent up-close-and-personal view of trains loading and unloading at the Depot.

Using this technology, it is within the realm of possibility to someday extend the network from Chama Yard to Cumbres Pass and mount cameras on the Car Inspectors House for a panoramic view of the yard. However, this will require a train load of cash. It's more likely that the next major step will be cameras in Antonito Yard. Can you imagine a camera mounted on the Antonito water tank looking west down the main line of the Cumbres & Toltec? What an amazing view that would be!

If you're interested in seeing these projects come to fruition, please consider donating. With your support, these and many other projects can be completed by the Friends of the Cumbres & Toltec Scenic Railroad. Have a Merry Christmas and *Grande* New Year!