Case Study

Antenna adjustment using spectrum analyzer

ARBUCKLE COMMUNICATIONS INC, USA

Ardmore, Oklahoma, USA

Introduction

A wireless internet service provider encountered difficulties with a 17 mile microwave link while performing a network upgrade. For several days their professional cellular crew couldn't identify the problem with conventional methods and tools costing the company more than $1000 a day. However, when a Spectrum Compact was brought to the scene, it only took a few minutes to identify the problem and choose an appropriate solution.

Customer

Arbuckle Communications, based in Ardmore, Oklahoma, was founded in 1931. Nowadays company is a Wireless Internet Service Provider (WISP) with approx. 50 mile wireless network around the city. Company offers high-speed wireless internet for businesses and households as well as voice services.

Challenge

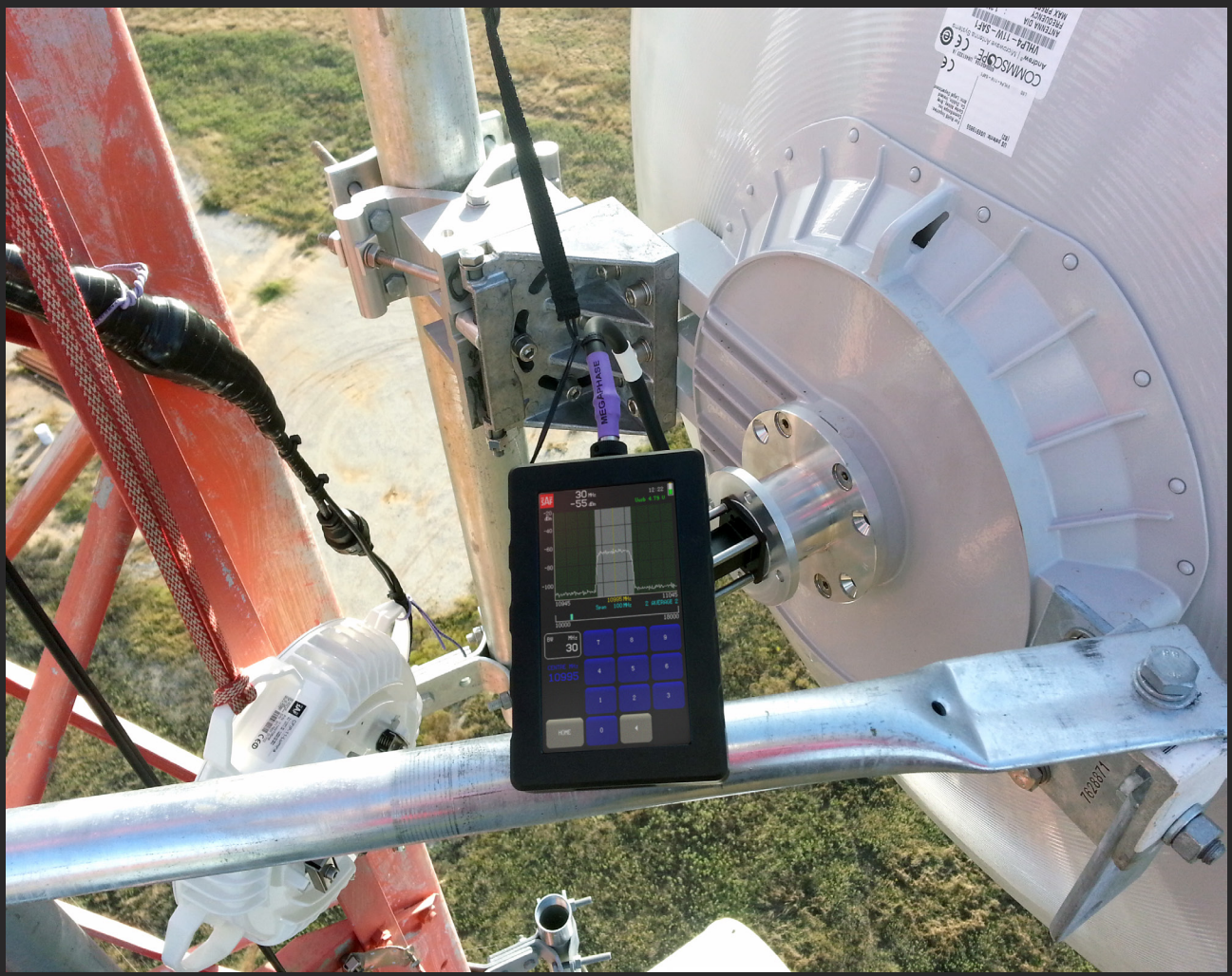
During the network upgrading process five new microwave links were installed. Installation crew detected problem with one 11GHz 17 mile link with 4ft antennas where the radio signal was 30dB off from the target level. After several attempts to align antenna using Voltmeter, the problem still persisted even after reaching maximum on the device. Besides, Voltmeter measurements were influenced by unwanted emissions thus distorting the readings. It became clear that conventional radio alignment tools and methods can't identify the cause of the problem thus threatening to significantly delay the commissioning of the network and increasing the company's expenses.

Solution

After many unsuccessful attempts to identify the problem customer was offered to do the link troubleshooting with Spectrum Compact. Problem was detected in less than 10 minutes by simply attaching the WaveGuide flange to the unit and pointing it to the direction of the transmitting radio.

"We didn't realize it was possible to align the antenna to the minor lobe from such a long distance. We were basically shooting blind until we pointed waveguide in the direction of other radio and detected the problem in just about 30 seconds. It's unbelievable to have such functionality in a cell-phone sized device."

Don Clowdus, CEO of Arbuckle Communications



With Spectrum Compact it was possible to detect that the antenna was aligned to the minor lobe of transmitting radio within just 10 minutes.

It turned out that perceived signal maximum was detected in a different angle than the receiving antenna was aligned thus indicating that the transmitting radio was been aligned to the side-lobe. Customer used spectrum analyzer's Max Hold feature to detect main-lobe and aligned the antenna accordingly. As a result customer ordered two kits of Spectrum Compact and 3 wave-guides for work on 6Ghz, 11Ghz, 18Ghz and 24Ghz links.

Spectrum Compact advantages

- Vendor neutral
- Immediate return on investment from an additional tower climb
- Potential to detect interference from existing Tier 1 carrier installations
- Ability to check the performance of radios before installation
- Option to save the link performance logs for further analysis and reference

"We were so impressed with the loaned device that we bought our own spectrum analyzer. It will pay for itself with the time saved on installing and servicing microwave equipment."

Don Clowdus, CEO of Arbuckle Communications