

# Telecom customer defines link problem with Path Align-R™



## Background

An American Telecommunications company had experienced problems during a number of backhaul link installations. They encountered several problems with troubleshooting due to the lack of proper test instrumentation and was left to guess and do trial-and-error mitigation.

When a wireless link is not working as expected it could be caused by a number of things:

- Faulty RF engineering design;
- Bad path alignment of the antennas;
- Faulty, or inadequate, antennas;
- Bad coax cable/connectors;
- Too long a path for the available power;
- Insufficient fade margin in the design;
- Weather variables and its effect on the transmission;
- Interference from other transmissions;
- Multi-path reflections from own signal, which can cancel the main signal path;
- Antennas that are installed too high (receiving far off transmissions from others).

## Customer tests links with Path Align-R™

The Customer turned to Pendulum Instruments Inc., and after testing the Path Align-R™ they found the solution to their problems. The Path Align-R was able to allow them to properly align the path and confirm the measured path loss, and in

so doing, eliminate the path and antennas as a source for any problems in the link.

This leaves only the radios and connection cables & connectors as the source of any problems because all the other issues (interference, fading, multi-path, link engineering, etc.) would prevent a proper path alignment with the expected received signal level.

### The voice of the customer:

"My co-worker/teamleader and I have been getting more and more experience with backhaul link installs/problem diagnostics. We are going through what some would call the "School of Hardknocks". Most of the troubleshooting we have done takes more time than it should due to the lack of proper tools. On multiple occasions we had to bring in a vendor to help us troubleshoot our major links, to "quickly" determine the source of the problem. We didn't have a good way to determine whether the problem was with the radios, cables, interference, multipathing, etc.

However, when we were able to test the link with the Path Align-R's, we were able to eliminate our equipment and cables as the cause of the problem. It was nice to see instant feedback of the signal path-loss, by simply adding the power output from our radios to the path-loss displayed on the Path Align-R™. We were also able to eliminate the possibility of interference."

## A complete test solution

The Path Align-R™ (models 2200/01 & 2240/01) test set is a high performance, affordable and complete test solution designed to quickly and accurately optimize the transmission path between two microwave antenna sites—all in a matter of minutes!

Because the Path Align-R™ directly drives the site's antennas, the optimization process is done without the need of the radios, expensive and complex test equipment, ground technicians, on-site AC power, cell phones, two-way radios, etc.

## Success Summary

The Customer's way to Success:

- Invest in Path Align-R™ - Antenna path alignment tester for microwave links
- Path Align-R™ eliminates the cause of the problem quickly and efficiently
- No need for expertise - alignment takes only minutes instead of hours

## Path Align-R™ - Antenna path alignment tester for microwave links

Product Features:

- Tuneable operating bands: 1.8 to 23.5 GHz (2240/2241)
- Path Loss displayed in dB (0.1 dB resolution/to -100 dB sensitivity), display updated every 300 ms
- Tone Ranging: Switchable, provides variable-pitch indication of path loss
- Continuous Talk and Listen over Link
- Battery-powered Alignment Test Set

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