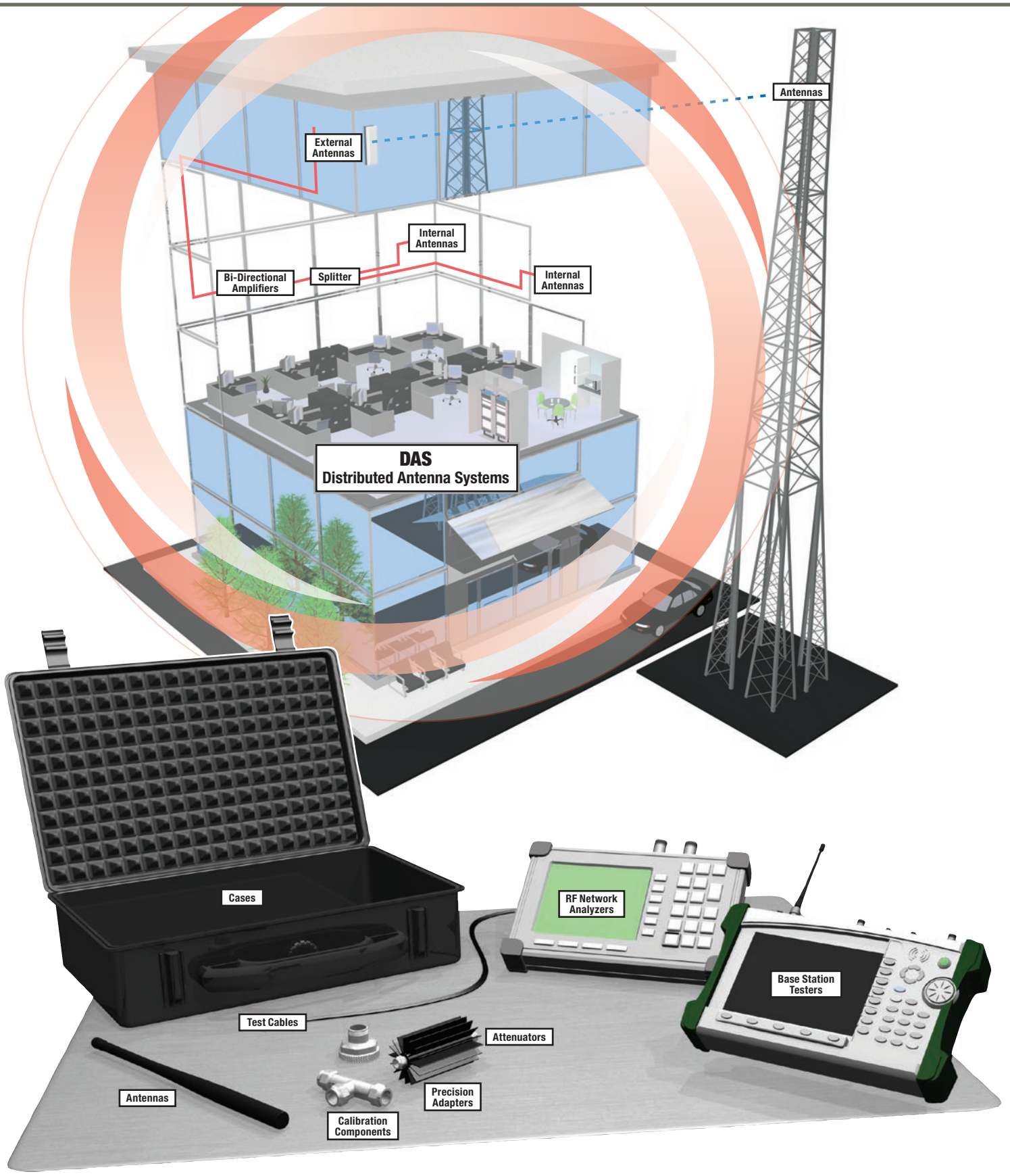
TESSCO

Solution: Network Optimization

Application: In-Building Test



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SUMMARY

The demand for wireless service throughout buildings and underground structures continues to grow. A distributed antenna system (DAS) and bidirectional amplifier are required to extend cellular or two-way service, 802.11 or even a paging system.

These systems require both line sweeping verification for jumpers and antennas that are installed in ceilings and/or walls and spectrum analysis to verify gain and isolation from the internal to external antennas.

FEATURES

- Spectrum analysis displays frequency vs. power
- Tracking generator provides two port measurement for gain or isolation
- Insertion loss and return loss verify impedance mismatches
- Verify antenna response
- Memory and reporting capabilities

BENEFITS

- Quickly isolate and identify cable damaged by being pulled through tight spaces
- Improve systems performance with optimal signal output
- Prevent unwanted feedback
- Identify problems rather that swap out components
- Develop detailed system statistics to help with future troubles

REAL WORLD EXAMPLES

Situation: A contractor installing the DAS for a large fortune 500 company had strict instructions to extend PCS coverage into the CEO's office but the customer did not want to see any antennas in his office.

Problem: The only access was an adjoining room where major I-beams and concrete blocked the signal from the internal antenna.

Solution: The spectrum analyzer verified the signal strength was not sufficient to cover the large room however they found an area where the signal was stronger. As they looked closer at the building design they found an opening in the structure to feed cable through. TESSCO provided an internal panel antenna that fit above the office ceiling tiles. The CEO got the signal he needed without any unsightly antennas.

Situation: A mobile system installation company had designs for in building coverage that called for a passive DAS system to provide the coverage of a large underground garage. The incoming signal strength, antenna gain and cable losses were all calculated to work but the signal was not sufficient.

Problem: The location for the external antenna was behind a line of trees so the incoming signal was not strong enough and the internal cable run was 50 feet longer due to the structure of the garage.

Solution: A spectrum analyzer was used to see the signal and verify that the system was working but it was marginal at best. Any weather events would mean this system would not provide consistent performance. The design was changed to include a bi-directional amplifier which provided the gain necessary for consistent signal coverage.

Situation: A building owner wanted to promote complete cellular coverage in the business suites he rents. He self installed a bi-directional amplifier to boost the signal throughout his building.

Problem: The DAS created so much noise on his calls that any conversation was unintelligible.

Solution: The owner hired a contractor who used a spectrum analyzer with a tracking generator option. He injected a signal into the amplifier and saw the isolation was not within tolerance. He moved the internal antenna away from the window and got the isolation necessary to prevent oscillation but still provided good coverage inside.

ADDITIONAL CONSIDERATIONS

- What are all of the types signals you want to cover in the building?
- What components are in your DAS?
- What is the highest and lowest frequency of use?
- What carrier are you using, and have you notified them?
- Exactly what tests do you need to measure?
- What test equipment is currently being used?
- What connection types do you need to interface?

PRODUCTS

- Spectrum analyzer with tracking generator option.
- Base station tester if your need to see PN numbers for CDMA.
- Attenuators and adapters
- Test cables
- Transit case
- Optional power sensor