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Measuring in-building coverage performance with test tools

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Berkeley Varitronics Systems Background in RF



- Established in 1972 in Berkeley Heights, NJ
- Specialized in custom RF engineering designs
- Designed and shipped 10,000+ test transmitters and receivers
- Continue to serve wireless industry with over 20 unique RF test and security products



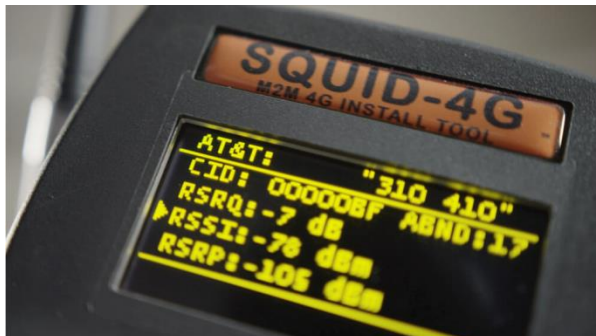


Indoor Coverage Scan

Simple tools determine coverage for 3G & 4G networks

4G LTE	FRQ	MHz	RSSI
Verizon	751.0		-53
AT&T	739.0		-56
T-Mobile	2138.6		-59
▶AT&T	1935.0		-88

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- 2016 - 70% of wireless traffic is indoor. There is a tremendous demand to improve communications.
- Local municipalities have issued ordinances to ensure there is adequate radio coverage of public safety signals.
- **RSSI** is important for **3G**...but for **4G LTE** measure **RSRP**



Dual Wide-Band Stimulus Source



Dual-Band Stimulus Source



- 690-2700 MHz 1 watt output power for each Tx

Small, lightweight and easy to operate

Full output power using both Tx with built-in battery lasts up to 2.5 hours

AC or DC powered for all day coverage or quick CW simulation anywhere



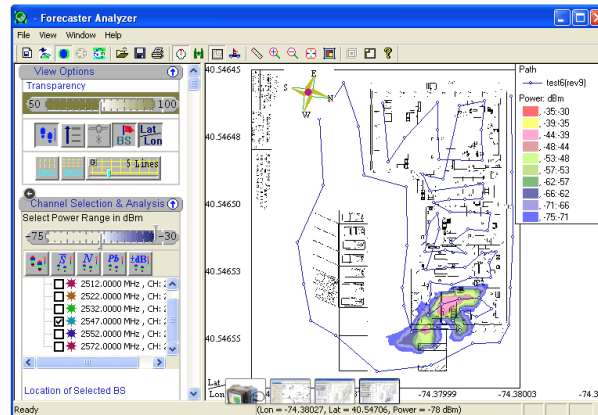
Transmitter & Receiver Indoor Coverage Combo



1 Watt Dual-Band
Stimulus Transmitter



Dual-Band Receiver

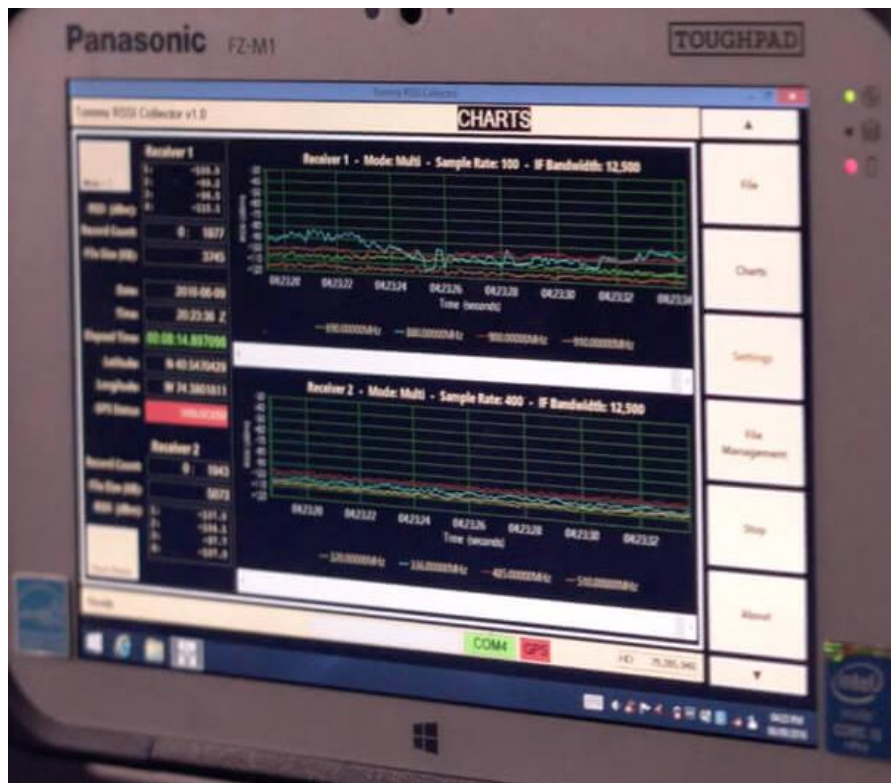




Walk About Data Collection



Dual-Band Receiver



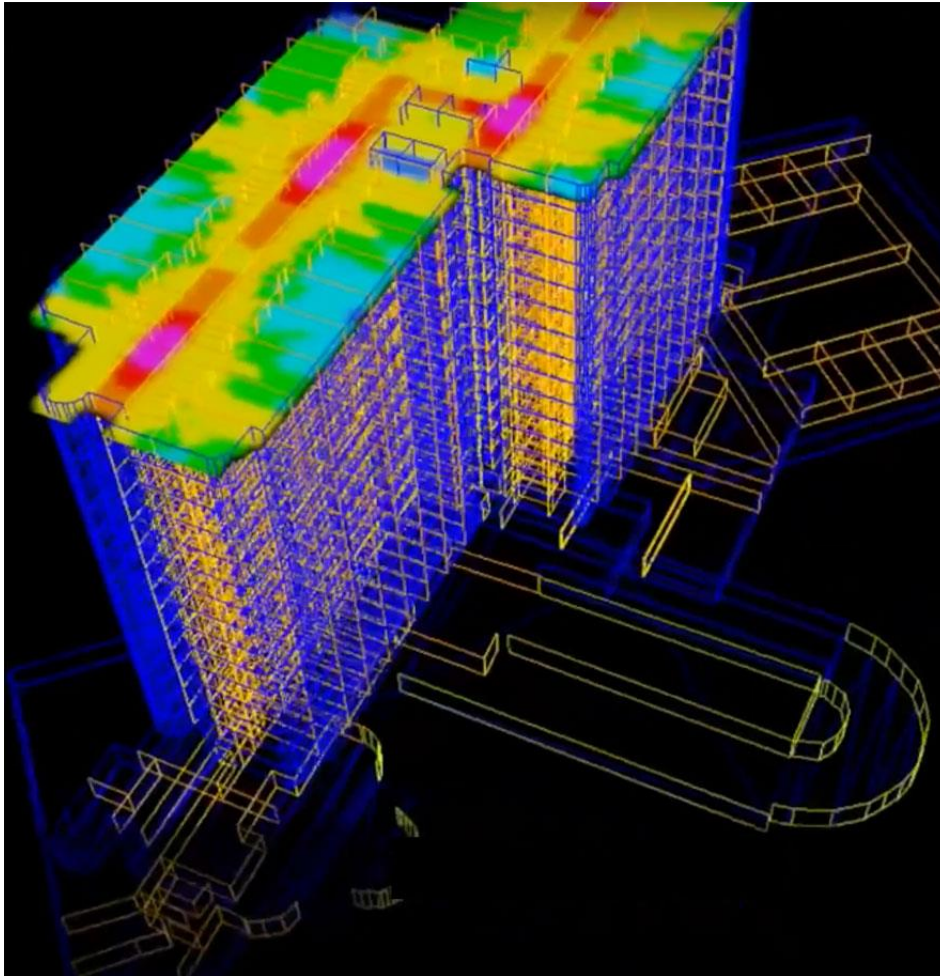
- Popular frequency band support for 690-960 MHz, 1700-2200 MHz, 2300-2700 MHz and more
- Dual receivers allow users to collect 2x more data in the field
- Internal 12-channel/12 satellite GPS receiver with active antenna
- Custom channel lists, sampling rates and IF bandwidth



Analyzing Collected Data



Post Processing Data



- All data measurements exported into spread sheet
- Collected data is typically exported into software such as iBwave
- Make sure test tools allow users to test 4G networks and prepare for upgrading to 5G future build-out using existing tools.