

New Test Automation of the octoBox STACK Wireless Testbed Improves Test Coverage and Speeds up MIMO Over-the-Air Throughput Measurements

New powerful test automation software controls throughput measurements vs. range and antenna orientation using open source iPerf in the octoBox wireless testbed; produces graphical test reports.

LITTLETON, Mass., Dec 1, 2014 – octoScope, Inc. is introducing new test automation software capabilities for its [OB-THROUGHPUT test script](#) at the Small Cells Americas show in Dallas, TX.

The enhancements to octoScope's OB-THROUGHPUT script include automation of the iPerf open source throughput measurement tool to step through traffic patterns, device orientation and airlink conditions emulated inside the octoBox® testbed, enabling rigorous testing running for long hours or even days without human intervention. Graphical reporting of test results includes plots of throughput vs. range and antenna orientation.

OB-THROUGHPUT controls throughput testing in the STACK series of compact anechoic [octoBox® wireless testbeds](#) that come complete with a built-in turn table, multipath emulator, interference generator and programmable RF attenuators.

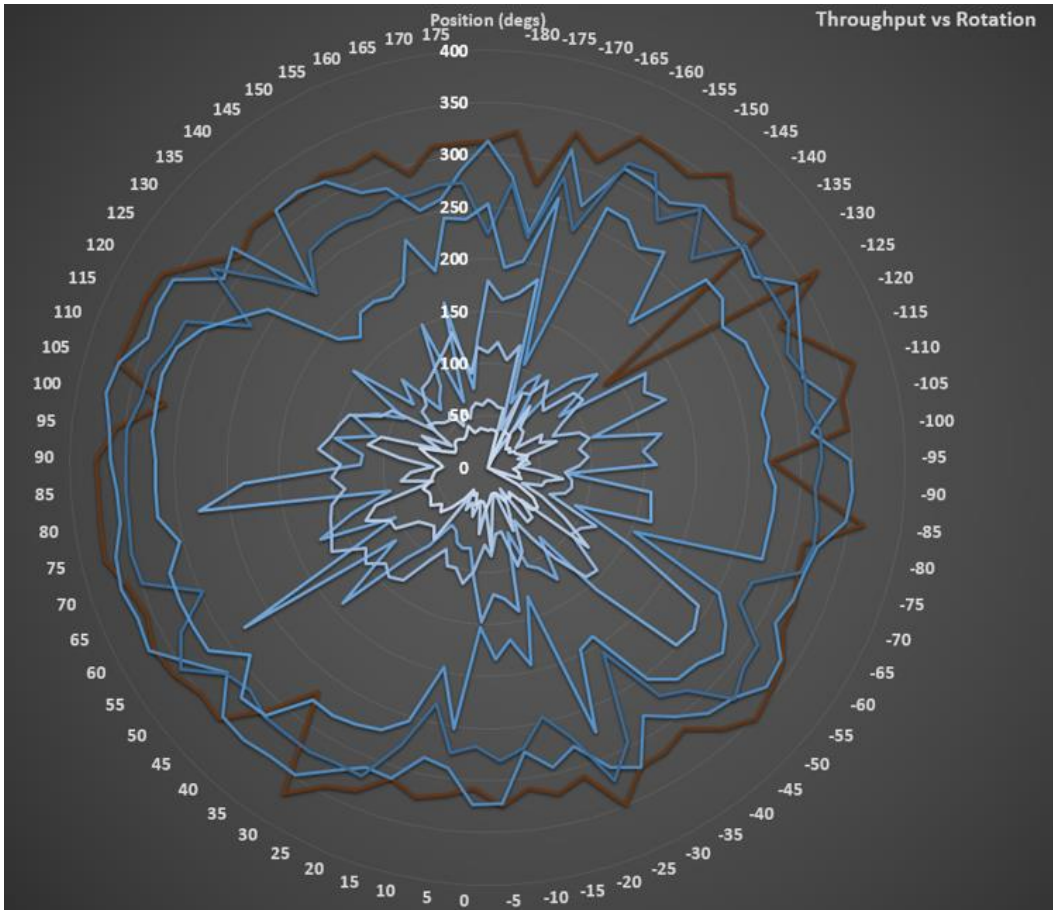
The OB-THROUGHPUT script is available to customers as TCL (Tool Command Language) source code for easy adaptation and expansion. OB-THROUGHPUT controls octoScope's [quadAtten RF attenuator module](#), built-in octoBox anechoic turn table and traffic generation and analysis tools. The script automatically initiates throughput measurements while rotating the device under test (DUT) at a preconfigured velocity (0 to 6 rpm) or through specified orientation steps (+/- 1 degree resolution). The script also controls the direction of traffic, both upstream and downstream.

Traffic generation and analysis tools supported by OB-THROUGHPUT include iPerf and IxChariot. OB-THROUGHPUT automatically starts and stops traffic generation, configures traffic patterns, runs through multiple traffic measurements of programmable duration and then automatically compiles test results for plotting. Excel templates are provided for easy graphical reporting with the plots arranged to clearly visualize the strengths and weaknesses of the DUT. For example, the throughput vs. orientation plot, resembling a fingerprint pattern, clearly shows where the nulls are in the DUT antenna field.

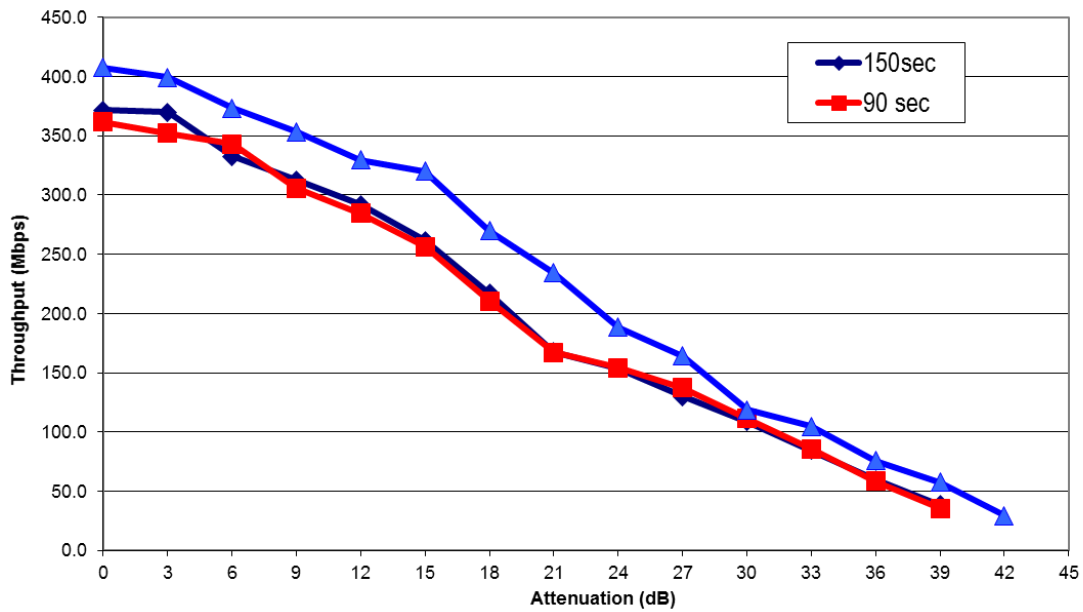
OB-THROUGHPUT manages multiple test data files produced by iPerf and IxChariot. At the end of the scripted sequence of tests, OB-THROUGHPUT automatically collates multiple results files into a single CSV (comma separated variables) file for easy plotting using the supplied Excel templates.



[Watch 5-minute octoBox testbed video](#)



Throughput vs. antenna orientation plot – each radial plot is taken at different path loss



Throughput vs. path loss measurements – courtesy of SmallNetBuilder.com – each point on the plot is measured for 1 minute while DUT rotates at 1 rpm

“SmallNetBuilder.com tests Wi-Fi router throughput by running an upstream and then a downstream test for one minute at each attenuation step. During each one-minute run, OB-THROUGHPUT rotates the turn table at 1 rpm (revolution per minute) in order to average throughput results vs. DUT orientation. Having the script control the traffic, direction of the data flow, quadAtten and turntable and then automatically integrate test data into a single set of plots saves a lot of labor and produces unbiased results with little human involvement. The automated rotation makes measurements meaningful by taking into account the differences in performance vs. orientation.”, says Tim Higgins, Principal of SmallNetBuilder.com, the benchmark test leader of the Wi-Fi industry.

“OB-THROUGHPUT even lets us remove the initial start-up period of each test run from the average throughput computation. When a wireless link is first established, the devices take a few seconds to sense the channel conditions and adapt the data rate of the link. During this training period, throughput may be non-optimal and can skew test results. Removing this training period from the test results makes the results more meaningful and saves a lot of time vs. human post-processing and manual plot production.”, Higgins adds.

The STACK series of octoBox testbeds is used by cellular operators, service providers and their suppliers, including device and chipset vendors to test Wi-Fi and 2G/3G/4G devices such as phones, sensors, access points and small base stations.

“Throughput measurements of 802.11ac devices is a common application for the octoBox STACK series testbed.”, says Jim Alnwick, octoScope’s SVP of Sales. “Automated and repeatable throughput measurements help our customers get better tested products to market sooner.”, Alnwick adds.

Craig Mathias, Principal at the wireless and mobile advisory firm Farpoint Group, said “Network operators constantly need reliable, repeatable, and expedient testing of the latest mobile devices to ensure that Wi-Fi and cellular networks continue to meet service-level expectations. Of primary importance to the wireless market is test automation that minimizes any opportunity for human error and ensures absolute objectivity when comparing devices from different vendors and verifying interoperability. The automated octoBox STACK is an ideal, cost-effective solution for wireless operators, particularly with today’s increasing interest in Wi-Fi offloading.”

The octoBox STACK

The octoBox wireless testbed is a compact and inexpensive alternative to conventional anechoic chambers and screen rooms. It is delivered ready to use and tests throughput vs. range in the presence of realistic yet controlled wireless path loss and multipath conditions. It is being used by wireless operators, device manufacturers and chipset vendors in markets including Wi-Fi, 2G/3G/4G mobile communications, medical devices and robotics. The octoBox test solution is [highly-praised](#) by its diverse users.

The built-in turntable inside the octoBox-TT model is software-controlled to perform measurements at varying orientations of the device, which is important for understanding the non-uniform antenna radiation patterns. By enabling precise positioning of devices during tests, the turn table eliminates a key point of ambiguity for operators comparing competing Wi-Fi (802.11 a/b/g/n/ac) and cellular (GSM, UTMS, LTE, FDD, TD-LTE and LTE-Advanced) solutions. It measures MIMO throughput in the presence of multipath and path loss when used with the octoBox [MPE \(multipath emulator\)](#) and [quadAtten™ programmable attenuators](#).

octoScope’s President, Fanny Mlinarsky, concludes: “Good performance of wireless devices and networks is achieved through laborious and repetitive pre-deployment testing. For this reason, test automation is key to fast advancement of the wireless industry. To catch every issue with the new complex devices, engineers must test numerous traffic and noise scenarios at a full range of device orientations. Verifying interoperability among devices from different vendors can take months of repetitive

testing. And when it comes to repetitive testing, computers that never get tired or bored tend to do better than humans.”

About octoScope

octoScope is the leading supplier of wireless test solutions and services to companies building or deploying wireless communications devices and networks, including LTE, Wi-Fi and Bluetooth. octoScope is the market leader in accurate and repeatable automated testing solutions, and is the recipient of a National Science Foundation grant. Our patent-pending architecture redefines the accuracy, stability, economics and value of over-the-air wireless testing and includes octoBox throughput, roaming, mesh and Wi-Fi Alliance testbeds.

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