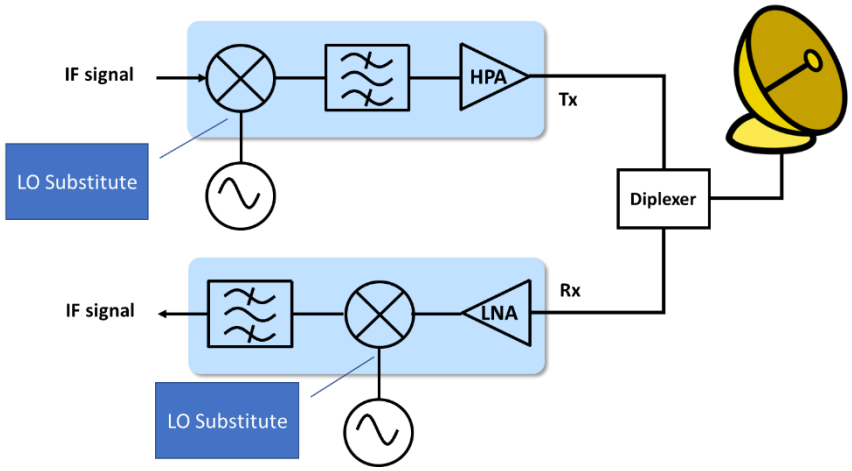
Boonton

APPLICATION BRIEF

Upconverter and Downconverter Test
Local Oscillator Substitution

Design, Verification, and Troubleshooting of radar and communication systems often involves examining their up and downconverters. For example, if the overall system is exhibiting bit errors, or radar target returns are being masked by noise, what is the root cause? Loop back bit error rate (BER) testing may highlight the problem, but is the issue in the transmit or the receive chain and, when that has been determined, which part of the chain is the root cause?



Local oscillator (LO) substitution is an important technique when testing up and downconverters in communication systems. It enables design engineers and technicians to evaluate signal chains without their performance being masked by the characteristics of the designed-in LO or to determine if the LO is the source of issues when the system is not performing properly.

RF or microwave signal generators are the tool of choice for LO substitution applications.

Today's Test Challenges

Need for Better Signal Generation Tools	• Low phase noise needed for less chance of masking a doppler shifted target return. • Low phase noise spreads less energy into adjacent channels and minimizes m-QAM symbol errors. • Fast list mode switching time meets a wider range of fast frequency hopping applications.
Greater Assurance of Test Results	• Low phase noise and jitter enable measurements that can lead to better product specifications or higher yield.
Lower Cost of Test	• More capable instrumentation to adapt to changing measurement requirements without additional investment. • More cost-effective instrumentation enables cost savings or the ability to equip engineering team more fully. • Smaller and lighter equipment reduces rack/bench space and structural support.

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The Boonton SGX1000 series of RF Signal Generators addresses the challenges faced by engineers and technicians who need to substitute for local oscillators during design, verification, or troubleshooting by providing better generation tools, test result assurance, and a lower cost of test. The unique architecture of the SGX1000 series means that both fast switching and low phase noise can be achieved simultaneously in the same instrument in an affordable compact, lightweight package. There are three models in the series:

- SGX1003 10 MHz to 3 GHz, -40 to +18 dBm
- SGX1006 10 MHz to 6 GHz, – 40 to +18 dBm
- SGX1018 100 MHz to 18 GHz, -10 to +17 dBm

Challenges	SGX1000 Addresses the Challenges
Need for Better Signal Generation Tools	• Low -122 dBc/Hz phase noise (3 GHz and 10 kHz offset) and low 60 fs integrated phase jitter. • Step and list sweep modes with lightning fast switching speed of 350 µs. • Fast list mode switching time meets a wider range of fast frequency hopping applications.
Greater Assurance of Test Results	• Low phase noise and jitter means that the DUT/EUT test result are not limited by the signal generator.
Lower Cost of Test	• Lower phase noise, faster switching, **and** lower priced than other signal generators in its class. • Fast 350 µs list sweep frequency switching speeds up test throughput. • Half rack, 2U form factor consumes less rack and bench space.

More information available at: https://boonton.com/sgx1000