

Test Instrumentation Catalog



Solving Demanding Aerospace and Defense Microwave Test Problems

wideband Radar receiver calibration

instrumentation Radar and high resolution Radar test

low-noise local oscillator substitution

wideband power amplifier testing

replacing obsolete signal generators and network analyzers



Are your test needs changing?

- ▣ MTI Doppler Radar requires state-of-the-art ultra-low phase noise test signals
- ▣ Calibration of next generation wideband receivers requires fast, accurate frequency switching and measurement
- ▣ Instrumentation and high resolution Radar requires narrow pulse generation and broadband amplification
- ▣ Long-lived ATE requires easy replacement of obsolete test equipment
- ▣ Increased signal switching and routing requires well matched signal paths throughout the test system

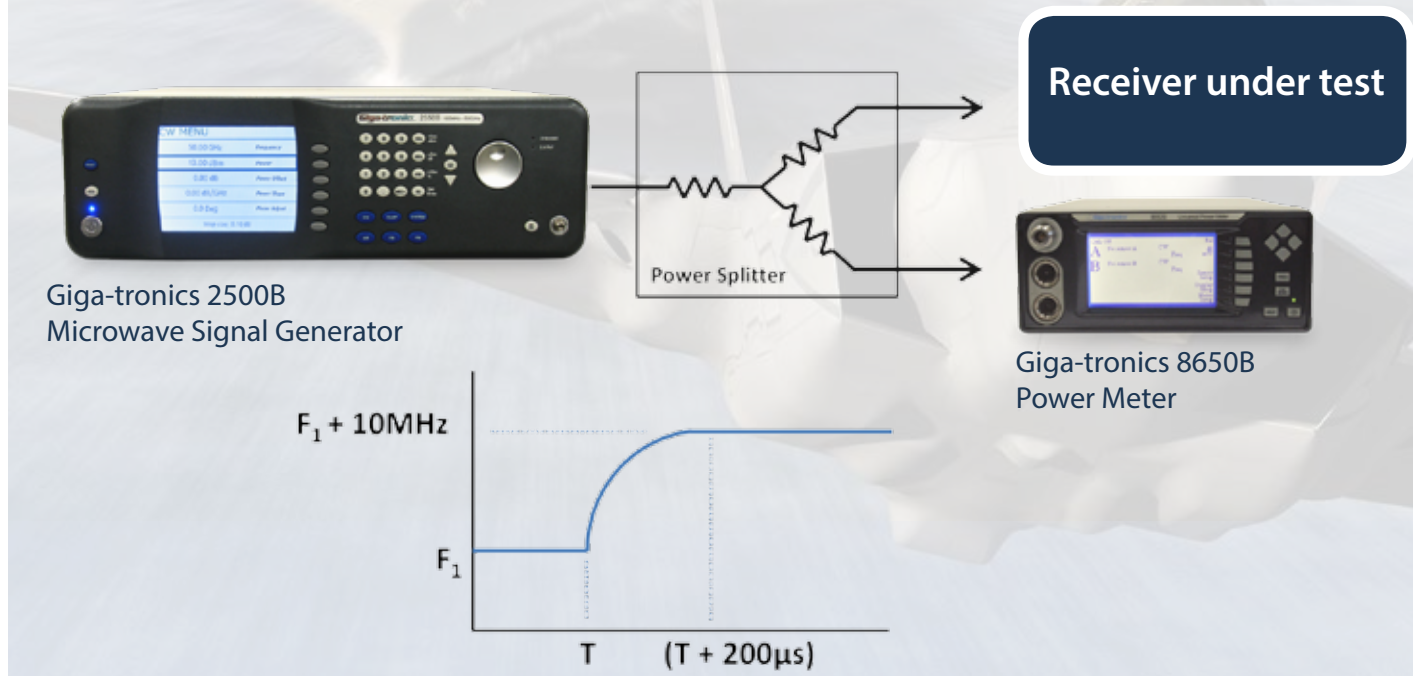


Wideband Radar Receiver Calibration

Wideband Radar receivers are used extensively in ES (Electronic Warfare Support), EA (Electronic Attack), and EP (Electronic Protection) systems. Calibration of these wideband receivers requires the generation of a large number of calibration frequency points across their operational bands. As thousands of calibration points need to be established across many GHz of frequency, the ability to tune, settle and measure at very high speeds is highly advantageous.

The Giga-tronics 2500B is ideal for these data-intensive applications, providing fast frequency switching speed with no compromise in phase noise or harmonics performance. The 2500B can step frequency in less than 200 μ s for frequency increments up to 10 MHz.

Power level accuracy can be increased by using a power meter to measure amplitude. Fast reading power meters, such as the Giga-tronics 8650B with diode power sensors can achieve CW measurement speeds of about 600 μ s per reading.



Frequency Steps:	10,000	100,000	1,000,000
Amplitude Steps:	10	20	30
Time to generate and measure for up to 10 MHz steps	20 sec	7 min	2 hours

Total time for stepping from 2 GHz to 18 GHz with frequency and amplitude changes at each step.

For even faster switching speeds, please contact Giga-tronics - inquiries@gigatronics.com

Instrumentation Radar and High Resolution Radar Test

The testing of Instrumentation Radar, high resolution Radar and near field antenna requires a rapid stream of very narrow RF pulses with small frequency increments, either after a group of pulses or pulse-to-pulse. For example, testing may require pulse widths in the 10 ns to 20 ns range with relatively rapid pulse repetition intervals, and with frequency increments of 10 kHz to 1 MHz.

The Giga-tronics 2500B series Microwave Signal Generators offer pulse widths as narrow as 10 ns with 3 ns typical rise and fall times. The 2500B can step frequency and amplitude and trigger a pulse stream at each step.



The Giga-tronics microwave power amplifiers offer outstanding pulse performance. Because these are broadband amplifiers, they do not exhibit the pulse performance limitations common to narrowband amplifiers.



The rise and fall times of the Giga-tronics broadband microwave power amplifiers are less than 5 ns with minimal overshoot or ringing

Amplifier Selection Guide		
GT-1000B	2 to 18 GHz	10 W 2 to 8 GHz/ 5 W to 18 GHz
GT-1000B Opt. 06	0.1 to 18 GHz	10 W 0.1 to 8 GHz/ 5 W to 18 GHz
GT-1020A	2 to 18 GHz	½ W
GT-1026A	2 to 26.5 GHz	½ W
GT-1040A	2 to 40 GHz	¼ W
GT-1050B	2 to 50 GHz	¼ W
GT-1051B	0.1 to 50 GHz	¼ W
Freq. GHz	0.1 2 18 20 26.5 40 50	

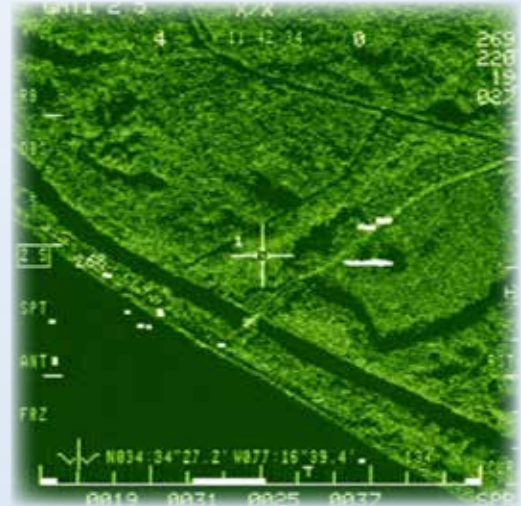
Low-Noise Local Oscillator Substitution

Today's modern Radars have new performance challenges. They are tasked to produce detailed images used in surveillance for GMTI (Ground Moving Target Indicators):

- Protecting nation's borders
- Finding suspected drug operations
- Detecting insurgent activities

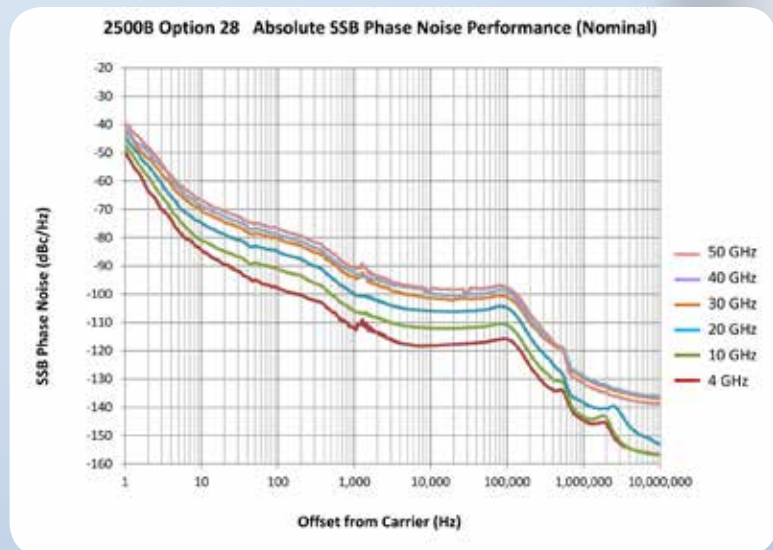
Important imaging Radar specifications include the ability to track slow moving objects. This means that low close-in phase noise is required to resolve these slow moving objects.

Low noise, stable local oscillators are a critical component of any Radar design. Emulating these oscillators in Radar design and test requires a microwave signal stimulus such as the Giga-tronics 2500B, with ultra-low close-in phase noise and high signal purity.



Giga-tronics also offers low-noise YIG-based synthesizer modules and oscillators.

Contact your Giga-tronics sales representative for more information.

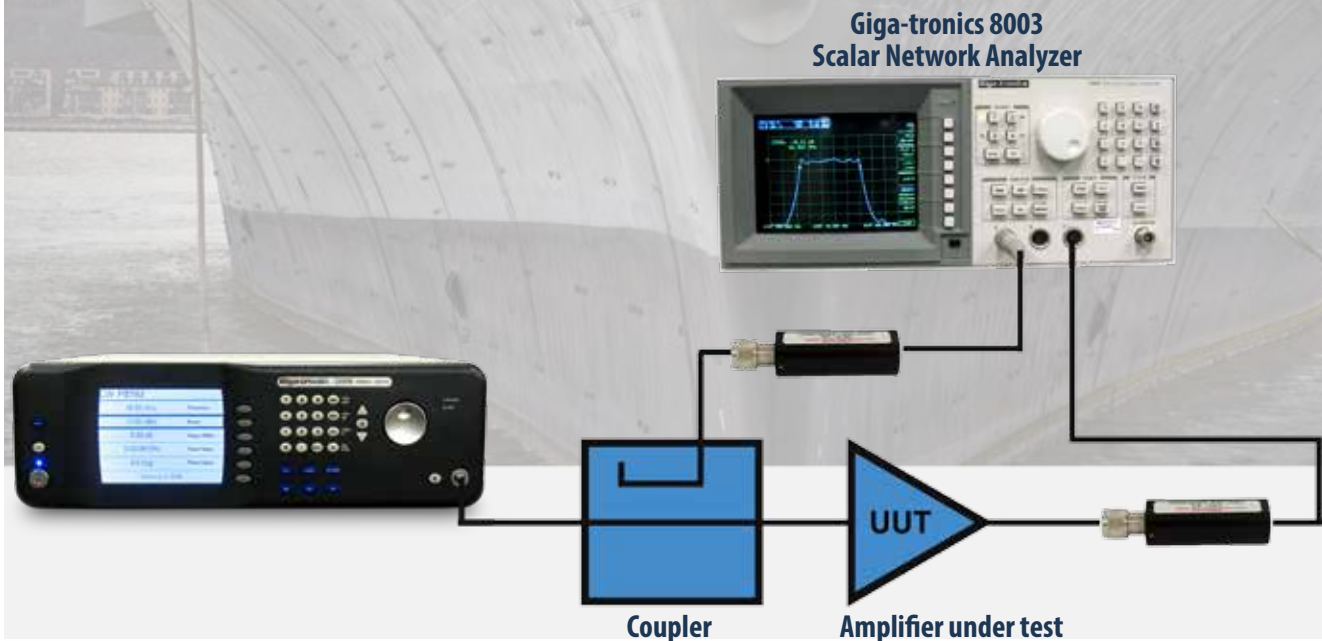


Giga-tronics 2500B Option 28 ultra-low close-in phase noise

Wideband Power Amplifier Testing

There are many RF and microwave signals on the battlefield and on ships and aircraft. These critical signals range from communications to radar to navigation to IED jammers. Many of these critical signals rely on microwave power amplifiers to drive antennas or drive very high power transmitters. Regular testing and maintenance is required to verify amplifier performance and insure proper signal fidelity.

The Giga-tronics model **8003 Scalar Network Analyzer** is ideal for testing and characterizing microwave power amplifiers, making accurate measurements over a frequency range of 10 MHz to 40 GHz with wide dynamic range. The 8003 can be used to effectively and efficiently verify the performance of microwave power amplifiers. Measurement of amplifier power gain, gain compression and frequency response are fast and easy with a scalar network analyzer.



SPACE SYSTEMS MILITARY COMMUNICATIONS
LESS COMMUNICATIONS ADVANCED AVIONICS
FROM SIMPLE TO MISSION CRITICAL APPLICAT
MILITARY COMMUNICATIONS AND RADAR WIRE
TIONS ADVANCED AVIONICS MEDICAL DEVICES

Replacing Obsolete Signal Generators and Network Analyzers

Replacing old obsolete signal generators in legacy automated test environments (ATE) presents a challenge mostly due to the inability to change the Test Program Sets (TPS).

- Changing a TPS typically requires re-qualifying the test system
- The original code compilers may no longer be available
- The programmers who know the code may be long gone

The solution to replacing an obsolete signal generator without impacting the TPS is to use a new signal generator that is **code compatible** with the old signal generator. The Giga-tronics 2500B series Microwave Signal Generators have successfully emulated the HP 8340, HP 8341, HP 8350, HP 8360, HP 8370, HP 8663 and HP 8673.

HP/Agilent	Giga-tronics	Options	Comments
8340A/B 10 MHz to 26.5 GHz	2526B Microwave Signal Generator	17A, 18, 26B	8757D compatible
8341B 10 MHz to 20 GHz	2520B Microwave Signal Generator	17A, 18, 26A	
8350 series up to 20 GHz	2520B Microwave Signal Generator	17A, 18, 26A	8757D compatible
8350 series up to 26.5 GHz	2526B Microwave Signal Generator	17A, 18, 26B	8757D compatible
8350 series up to 40 GHz	2540B Microwave Signal Generator	17A, 18, 26C	8757D compatible
8350 series up to 50 GHz	2550B Microwave Signal Generator	17A, 18, 26D	
83620 series 10 MHz to 20 GHz	2520B Microwave Signal Generator	17A, 18, 26A	
83640 series 10 MHz to 40 GHz	2540B Microwave Signal Generator	17A, 18, 26C	
83650 series 10 MHz to 50 GHz	2550B Microwave Signal Generator	17A, 18, 26D	
8370 series 10 MHz to 20 GHz	2520B Microwave Signal Generator	17A, 18, 26A	HP 83731A, 83732A, 83731B, 83732B models
8673C/D 10 MHz to 26.5 GHz	2526B Microwave Signal Generator	17A, 18, 26B	



Giga-tronics provides integration and implementation support to ensure the migration is as seamless as possible.



The Giga-tronics model 8003 Scalar Network Analyzer can replace obsolete analyzers including the HP 8757 in many applications.

Products

Microwave Signal Generators

The Giga-tronics 2500B Microwave Signal Generators offer state-of-the-art performance:



- ▣ Fast switching speed and high output power without any compromise in signal purity.
- ▣ Narrow pulse for testing today's high-resolution Radar.
- ▣ Ultra-low close-in phase noise, high-stability time base, fine resolution, multiple sweep modes and a full suite of analog modulation capabilities.

	2500B
Frequency Range	100 kHz to 2, 8, 20, 26.5, 40 or 50 GHz
Frequency Resolution	0.001 Hz
Max Leveled Output Power	+20 dBm at 20 GHz +11 dBm at 50 GHz
Time Based Stability	$< 5 \times 10^{-10}$ /day
Switching Speed	500 μ s per point
Phase Noise	< -109 dBc/Hz at 10 GHz and 10 kHz offset
Harmonics and Spurious	< -58 dBc

Microwave Power Amplifiers

- ▣ Wide frequency range eliminates the need for band switching and provides reduced cost and complexity with higher performance and reliability.
- ▣ Low noise, high gain and outstanding gain flatness for R&D Lab amplifiers or system amplifiers in automated test systems.
- ▣ Excellent pulse fidelity for Aerospace and Defense applications.

Model	Freq. Range (GHz)	Psat (Minimum)	Gain (Nominal)	Gain Flatness (Maximum)	Noise Figure (Typical)
GT-1000B (Opt. 06)	2 to 20 (0.1 to 18)	0.1-8 GHz: 38.5 dBm (7W) 8-12 GHz: 37 dBm (5W) 12-18 GHz: 36 dBm (4W)	40 dB (35 dB)	± 3.5 dB	< 10 dB
GT-1020A	0.1 to 20	0.1-10 GHz: 26 dBm (0.4W) 10-20 GHz: 25 dBm (0.3W)	35 dB	± 3.5 dB	< 5 dB
GT-1026A	0.1 to 26.5	0.1-18 GHz: 26 dBm (0.4W) 18-26.5 GHz: 21 dBm (0.1W)	25 dB	± 3.5 dB	< 6 dB
GT-1040A	0.1 to 40	0.1-0.5 GHz: 20 dBm (0.1W) 0.5-26.5 GHz: 23 dBm (0.2W) 26.5-40 GHz: 20 dBm (0.1W)	20 dB	± 3.5 dB	< 8 dB
GT-1050A	2 to 50	2-10 GHz: 26 dBm (0.4W) 10-30 GHz: 25 dBm (0.3W) 30-40 GHz: 23 dBm (0.2W) 40-50 GHz: 20 dBm (0.1W)	25 dB	± 3.5 dB Nominal	< 10 dB
GT-1051A	0.1 to 50	0.1-2 GHz: 27 dBm (0.5W) 2-10 GHz: 26 dBm (0.4W) 10-30 GHz: 25 dBm (0.3W) 30-40 GHz: 23 dBm (0.2W) 40-50 GHz: 20 dBm (0.1W)	25 dB	± 3.5 dB Nominal	< 10 dB



Products

Microwave Power Meters and Sensors

The Giga-tronics 8651B Single-Input Power Meter and 8652B Dual-Input Power Meter offer high-performance RF and Microwave power measurement with high accuracy and fast measurement speed. Giga-tronics also offers the GT-8550B family of USB Power Sensors.



Key Specifications:

- ▣ Frequency Ranges to 50 GHz
- ▣ Power Ranges from -70 dBm to +47 dBm
- ▣ Measurement Speed up to 26,000 readings/sec



Giga-tronics GT-8550B USB Power Sensor

Scalar Network Analyzer

The Giga-tronics 8003 Precision Scalar Analyzer combines a 90 dB wide dynamic range with the accuracy and linearity of a power meter.



Key Specifications:

Measures active and passive components with power meter accuracy from 10 MHz to 40 GHz.

- ▣ Sensor frequency range from 0.01 to 18, 20, 26.5, or 40 GHz
- ▣ Dynamic Range: 90 dBm; -70 to +20 dBm CW; -20 to +20 dBm Pulse
- ▣ Linearity of ± 0.04 dB (1%) over the entire 90 dB span



Power Accuracy Calibration

Microwave Signal Switching Solutions

ATE signal switching for Satellite, MIC and Mil Radio Testing



From off-the-shelf to tailored solutions
... meet your demanding requirements

Giga-tronics designs and manufactures modular ASCOR brand switch products with a frequency range from DC to RF/microwave to 50 GHz and lightwave and the capability to switch from low-level to high-power signals. The ASCOR line offers a complete range of VXI™, PXI™, GPIB and LAN controlled switching and digital I/O modules for military/aerospace automatic test applications. If there is not already an off-the-shelf product to meet your requirements, Giga-tronics offers tailored solutions available quickly at off-the-shelf prices.

visit the website: www.gigatronics.com/ATE-Switching
or ask your Giga-tronics representative for our switching catalog



Microwave Synthesizer Modules, YIG Oscillators and Filters

Our core technologies in microwave signal generation and filtering have enabled us to design unique integrated electronic assemblies for leading aerospace and defense companies. These include special microwave synthesizers, ultra low noise YIG oscillators and fast tuning and highly accurate YIG filters.



visit the website: www.gigatronics.com/category/showCustom/Microwave-Components-and-Assemblies
or ask your Giga-tronics representative for our components catalog



Service

Finding Solutions...

... the experts for RF/Microwave Test & Measurement

Support services include application engineering assistance to help your team with integration and next-generation product and process technology.



Repair Service

All repairs are certified and traceable to NIST, and include calibration to published factory specifications

- ▣ ISO-9001:2008 with AS9100 certification
- ▣ Repair record retention
- ▣ 90-day repair warranty
- ▣ Factory-authorized hardware, firmware, and software upgrades, as applicable

Calibration Services

All calibrations are processed in full accordance with ANSI-Z-540-1 1994, ISO 10012, and MIL-STD-45662

- ▣ Calibrations performed against same specifications used in original manufacturing of the instrument
- ▣ All test equipment is traceable to NIST
- ▣ ISO 9001:2008 and AS 9100:2009 certificate of registration
- ▣ Adjustment as necessary
- ▣ Certificate of calibration with list of standards is supplied
- ▣ Calibration sticker with next calibration due date is supplied
- ▣ Calibration seal is affixed to the instrument
- ▣ Calibration test data report



www.gigatronics.com

Founded in 1980, Giga-tronics Incorporated (Nasdaq "GIGA"), an ISO 9001 and AS 9100 certified company, headquartered in San Ramon, California, is a leading engineering-and-design manufacturer of best-in-class RF and microwave signal generators, microwave power amplifiers, USB power sensors, microwave power meters and broadband switching matrices. R&D, production and test managers, scientists, engineers and technicians around the world use Giga-tronics test equipment to realize higher productivity and greater ease of use in many applications: ATE systems, aerospace & defense, communications and general microwave component testing.

Contact

For Quotes, Order Assistance, or Demonstration Equipment:

email: inquiries@gigatronics.com

or call toll free 800.726.4442 (USA), +1 925.328.4650 (International)

or locate your nearest Giga-tronics representative at www.gigatronics.com/index.php/index/showOffice

For Technical Assistance:

email: applications@gigatronics.com

or call toll free 800.726.4442 (USA), +1 925.328.4650 (International)



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