



# **Aeroflex Test Solutions**

## **Shortform Catalog**

# Aeroflex



Aeroflex Test Solutions is a global leader in the Test and Measurement Instrumentation marketplace. Our products support a wide range of industries, including aerospace, defense and wireless mobile and broadband communications. Our proven solutions encompass a full spectrum of instrumentation from turnkey systems, stand alone boxes or modular components that provide customers with highly reliable, customized, innovative and cost effective testing tools. We have leadership positions in specialty communications test niches like LTE wireless test, PMR and military radio test, commercial and military avionics test and satellite STE and broadband test.

## A Passion for Performance



Passion? Can a company have passion? Honestly, we can't think of a better word to describe Aeroflex. We are passionate about our performance, driven to do better... Better than our competition, of course. But they're not our standard of performance. What really drives us is the desire to do better than we've done before. You can see it in our Solution-Minded approach to every customer need, in our Performance-Driven insistence that every solution is a cut above and in our Customer-Focused definition of performance.



**solution-minded**



**performance-driven**



**customer-focused**



You can see it in our people, in the way they work, take ownership and fight for even the smallest detail in any project. The real proof of our passion is in our products, though. There's always something about an Aeroflex product - something more, something faster or something making it more cost-effective. And it's designed to meet your needs - no matter how challenging they are - head on.

A passion for performance. It's more than a principle or even a philosophy. It's a promise to do whatever it takes to help you achieve your goals.

This short-form catalog is one of the best sources we can give you to help you achieve your goals by staying up to date on the latest test and measurement solutions from Aeroflex. This catalog provides a great top-level overview of Aeroflex solutions.

We then invite you to continue your research by exploring our in-depth product information, application notes and other technical resources on our web site at [www.aeroflex.com](http://www.aeroflex.com).

# ENABLING COMMUNIC

## What's New?

New in this issue are products such as the GPSG-1000 GPS/Galileo Portable Positional Simulator, ALT-8000 Radio Altimeter Tester, S-Series Signal Generators, CS9000 Broadband Signal System, AX-Series Semiconductor Test Systems, EAST500 LTE Test System and continued enhancements to the 3920 Radio Test Set, 3500A Radio Test Set, 7100 LTE Digital Radio Test Set, PXI 3000 Series and TM500 Test Mobile.

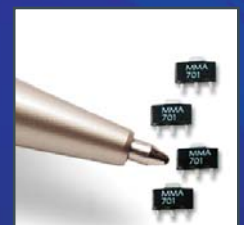
We have also included products from our recent acquisition of Willtek. They include the 2201 ProLock Phone Tester, 4400 Mobile Phone Tester, RF Couplers and Shields and the 9100 Hand-held Spectrum Analyzer Series. These products give Aeroflex an increased breadth of product offerings.

Now, take a look! Check us out and see all we have to offer! We're passionate about becoming a partner in your success! And don't forget that Aeroflex.com delivers the latest information about our products.



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# CATIONS WORLDWIDE



# Communications

## Land Mobile Test

The Aeroflex family of radio test sets is the result of more than 50 years experience in providing superior radio test solutions. The combination of rugged dependability, high performance and software configuration provides the next generation of proven test products for your analog and digital radio test needs. Only Aeroflex provides the widest range of dedicated land mobile radio test sets, with full functions for the latest digital technologies. Aeroflex's wide range of products cover land mobile radio applications in the HF, VHF, UHF and 700/800 MHz band, with an industry first frequency range to 2.7 GHz. Aeroflex develops, manufactures and markets radio test solutions that protect your investment with upgradeable software modules to meet the latest radio test requirements.

### 3920 Series Digital Radio Test Set



- The most comprehensive software defined test solution on the market today
- Full AM, FM, SSB analog measurements
- 2 MHz – 2.7 GHz operation
- P25 and SmartZone™ and SMARTNET™ trunking test applications
- High performance spectrum analyzer, dual channel oscilloscope and analog meters
- 0.01 PPM timebase for super accurate frequency measurements
- Support for DMR (MOTOTRBO™), NXDN™ and ARIB STD T-98 technologies
- Mobile, base and direct mode TETRA test functions
- Highly accurate EVM, power burst measurements and constellation displays
- Automatic test and alignment operation for ASTRO®, ASTRO® 25, and ASTRO® 25 XTL™ Series radios.
- Software upgradeable for next generation digital radio protocols
- IQCreator® allows for future proof RF generation of new digital waveforms

Building on a reputation of engineering excellence, the 3920 offers high performance tests equal to more expensive stand alone instruments. With advanced digital signal processing technology and rugged construction, the 3920 provides the most flexible, cost effective radio test system available. Featuring test capabilities for both analog and digital radios, the 3920 meets the need for testing both your legacy analog systems as well as the latest narrowband digital standards. The 3920 also features one button automatic test and alignment capabilities for many P25 radios including the Motorola Astro® 25 Series radios, enabling greater efficiency of test resources than ever before.

### 2945B - Communications Service Monitor



- Rugged lightweight package
- Full span spectrum analyzer with "live" look and listen
- Tracking generator with full offset tracking
- Accurate power measurement to 150 W
- Rugged lightweight package
- Full span spectrum analyzer with "live" look and listen
- Tracking generator with full offset tracking
- Fast auto-tune (typically <3 seconds)
- Accurate power measurement to 150 W
- Transient and harmonic analysis
- Color transfective superfast LCD with rapid refresh rate for easy monitoring and real time adjustment
- Analog trunked systems also available including MPT1327, EDACS and LTR® trunked radio and repeater test options

Portable, versatile and lightweight (12 kg/25 lbs.), the 2945B goes anywhere for the full range of parametric and signaling test. In addition to a full-span spectrum analyzer and tracking generator with an 80 dB dynamic range, a 50 kHz digital storage oscilloscope is included. It provides accurate power measurements up to 150 W, as well as harmonic and transient power analysis.

### Aeroflex LMT Products

- 3920 Series Digital Radio Test Set
- 2944B Communications Service Monitor
- 2945B Communications Service Monitor
- 2948B Low Phase Noise Communications Service Monitor
- 3500A Portable Radio Communications Test Set



## 2948B Low Phase Noise Communications Service Monitor

The 2948B has all the benefits of the 2945B, but with a low phase noise signal generator, for more critical receiver testing.

The 2948B Communications Service Monitor is the lightest, most rugged service monitor available with low phase noise signal generation. For field work, the 2948B provides an excellent combination of instruments for all types of maintenance work. In the workshop it provides all of the performance you would expect for exacting measurements.

## 3500A Portable Radio Communications Test Set

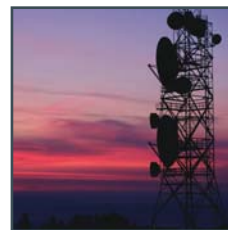


- 2 MHz - 1 GHz operation
- FM/AM transmitter and receiver tests
- P25, DMR, and NXDN digital radio test options
- Spectrum analyzer with <-136 dBm noise floor
- Tracking generator
- Oscilloscope
- Antenna and cable testing
- SINAD, distortion, RF power and frequency error meters
- Audio frequency counter and level meters
- DCS encoder and decoder
- DTMF generator and receiver
- Weighs less than 8 lbs.
- 5 hour battery life with continuous use
- -20 to +55 C operating temperature range
- Rugged construction (specifications for humidity, altitude, shock and vibration, MIL PRF 28800F Class II Certified)

The Aeroflex 3500A is the industry's first 1 GHz hand-held radio test set. At less than 8 lbs. and packaged in a cast magnesium alloy case, the Aeroflex 3500A is truly a rugged and portable radio test set. It combines many of the features of a bench top radio test set with the features of a Frequency Domain Reflectometer (FDR) into a lightweight, rugged and portable platform. Featuring full radio test set features with up to 7 hours of battery life, the 3500A is ready to be used anywhere.

Designed to meet the needs of avionics and land mobile radio tests, the 3500A provides fast, reliable measurements of the radio's transmitter and receiver parameters. New to the operation of the 3500A is the capability to test the latest narrowband radio systems including P25, DMR and NXDN.

The 3500A is perfect for testing radio transceivers, whether on a bench, installed in a vehicle or in some remote location. It also has the power to test the cables and antennas, making it the only hand-held radio test set that can test all the components of an installed radio system.



# Communications

## Land Mobile Test

### 8140 TETRA AirAnalyzer



Keep control of your TETRA network to provide the best possible service.

- Advanced protocol analysis using message sequence charts (MSC) to display the complex flow of communications in the signaling protocol between TETRA radios and the base station
- Exclusive quality of service analyzer charts issues within a radio cell over a given time period, including statistical evaluation
- Voice decoder monitoring and recording of ongoing voice communication in the network
- Measurement of channel and modulation parameters with the TETRA physical data analyzer
- GPS-assisted radio coverage measurements
- TETRA scanner to survey spectrum utilization
- Decoding of communication under static or dynamic air interface encryption

Professional users of TETRA demand reliable and safe network operation, and the best possible radio coverage. These requirements can be fulfilled with Aeroflex's 8140 TETRA AirAnalyzer, a unique and versatile tool that allows you to continuously analyze and maintain a TETRA network. No matter if you are analyzing radio coverage, call setup time, cell or control channel load, the 8140 TETRA AirAnalyzer is the right tool to get the full insight of your TETRA network. It is also well suited to examine issues arising during the introduction of new systems into a network and to perform interoperability testing during system development. The instrument is based on a standard protocol stack, which is used in the certified IOP test setup of the TETRA Association and is the accepted reference standard for TETRA protocol analysis.

### 2305 TETRA Test Set



A portable TETRA tester – Tailor-made for field service

- Supports TETRA mobile station and base station tests relevant for service
- Intuitive and failsafe user interface
- Made for the PMR field service environment
- Bright screen and robust case
- Portable, lightweight and compact
- Optional battery operation

The 2305 Stabilock delivers precise results quickly. The 2305 is based upon a TETRA-dedicated hardware platform with software options for different applications: The 2332 Base Station Test Option and the 2333 Mobile Station Test Option. No matter what application or TETRA frequency band, after a simple set up of the network parameters and frequency range, the tester is ready for operation. The large, high contrast color display is split into four sections for clear reading of test results in numeric or graphic format. All settings and commands are accessible via six softkeys or with one-hand operation using the turn-and-push dial. Reducing TETRA complexity to what is really needed in field service – with this operational concept, users can operate the instrument easily by just pressing a few keys!

### Aeroflex LMR Products

- 8140 TETRA AirAnalyzer
- 2305 TETRA Test Set

# Wireless

## LTE

The proliferation of smartphones and customer demand for a fast, ubiquitous, cost effective service is driving the rapid adoption of LTE (Long Term Evolution) and LTE-Advanced by network operators worldwide.

Manufacturers of LTE infrastructure and devices need reliable test instruments capable of addressing the challenges brought forward by this fast growing standard. Among the requirements of the LTE and LTE-A networks are higher data rates, multiband support, wider bandwidths, reduced latency, interference management, and greater complexity of modulation and antenna configurations that need to be thoroughly tested to deliver the value customers expect.

*"The inherent complexities of LTE and LTE-Advanced require equipment to be thoroughly tested to deliver the value customers expect."*

Moreover, LTE is being deployed in two major variants, Frequency Division Duplex (FDD) and Time Division Duplex (TDD). These technologies will enable operators to maximize spectrum utilization in an increasingly fragmented spectrum.

Comprehensive test coverage is required to ensure the next generation of mobile and network devices match the hopes and expectations of network operators and end users this includes: RF, baseband and protocol, realistic mobility and data traffic simulations. In addition, testing of Heterogeneous Networks, Self-Organising Networks (SON) and interference management techniques will become increasingly important. Aeroflex addresses each of these challenges with a growing portfolio of products that puts this capability within reach.



In the early stages of development it is necessary to test new LTE equipment using a layer-by-layer approach. Further on in the development, it's important to test networks with more than one mobile device to test scheduling. In the lead up to commercial launch, networks require complete end-to-end test scenarios that simulate hundreds or thousands of users over multiple cells and realistic mobility and traffic scenarios. Ensuring performance is maintained throughout the network will be a concern, especially as the number of users per cell grows and, with it, interference levels.

Aeroflex has been providing market leading wireless test equipment for well over a decade, and has been involved in LTE from the start. This has provided an in-depth understanding of the LTE standard, the essential elements that define system performance and the key test requirements that guarantee flawless deployment.

The complete portfolio of LTE test solutions from Aeroflex is aimed at addressing all aspects of LTE test. The portfolio encompasses LTE test solutions ranging from R&D through to manufacturing across the entire LTE equipment supply chain. Aeroflex provides test solutions for everything from chipsets to end user services, including base stations and handsets.

### LTE Products

- 7100 Digital Radio Test Set
- TM500 LTE Test System
- EAST500 Capacity Test System
- PXI 3000 Series RF Modular Instruments
- S-Series Signal Generators
- 3410 Series Signal Generator



# Wireless Infrastructure Test

Virtually every single base station in the world gets tested using Aeroflex equipment at some point in its life cycle—whether in R&D, manufacturing or network installation and maintenance. Aeroflex products support the following critical test applications:

#### R&D:

- TM500 LTE/LTE-A/HSPA+ Test Mobiles for leading edge L1/L2/L3 development
- TM500 multi-UE for optimizing scheduling algorithms and load testing

#### Manufacturing:

- 6113 GSM base station test systems for quality assurance and functional testing

#### Network rollout, maintenance and interoperability test:

- 6113 GSM base station test systems for critical RF performance measurements
- TM500 for drive testing
- EAST500 for load and capacity testing

### TM500 Test Mobiles – The Industry Standard



In the demanding world of developing new cellular equipment, base stations functionality is advanced compared to mobiles. In the dawn of the new technology there are no mobiles at all. But with the mobiles lagging behind how do you test the base station? Aeroflex, with its TM500 test mobiles, provides the answer. Need an HSPA+ handset UE? Choose the TM500. Need an LTE UE with 300Mbit/s performance? Choose the TM500.

Every major infrastructure vendor and a majority of femtocell manufacturers use TM500 throughout the development cycle. Why? Because it's the industry standard for 3GPP verification, validation and optimization. From HSDPA through HSUPA, HSPA+ and DC-HSDPA to LTE and LTE-A, the TM500 offers all the capabilities of a mobile terminal with advanced test functionality. And what's more, the TM500 roadmap is always in step with the latest demands of the industry to help Aeroflex's customers deliver their new products on time. Testing a single base station against a single mobile isn't enough though. Scheduling algorithms need to be optimized, and the base station needs to be load tested. With the TM500 Multi-UE and capacity variants, complex scheduler or capacity testing can be performed early in the design cycle and help deliver robust, flexible and high performance solutions to network operators.

### TM500 LTE and LTE-A SUE Test Mobile

- FDD and TD-LTE test mobiles compliant with latest 3GPP specifications
- Capable of supporting up to 300 Mbps downlink, 75 Mbps uplink
- Proven in over the air trials over a variety of 3GPP bands
- Layer 1/2 measurements and statistics, internal UE status and protocol messaging provided
- Supports a layered approach to testing with Layer 1 and Layer 2 analysis modes
- Higher layer protocol option supports Layer 3 and NAS
- 2 component carriers carrier aggregation with measurements per carrier
- Field performance for trial networks and proof of concept demos

The Aeroflex TM500 LTE/LTE-A Test Mobile is used for functional test and performance measurement of LTE/LTE-A base stations (eNode-B), femtocells and network infrastructure. UE control and measurement capabilities provide the low level UE access and internal UE visibility required to properly test and debug the eNode-B or femtocell and network.

### TM500 LTE Multi-UE and extMUE Option

- Functional load tester reproduces up to 128 UEs in one unit
- Number of UEs can be increased further as part of a capacity test solution
- Repeatable and deterministic control of each UE from a single user interface
- Ability to coordinate UEs precisely to test functionality, such as network access contention
- Scheduler performance testing and optimization via channel models
- Comprehensive Layer 1/2 measurements, charts and statistics
- Real traffic applications with statistics per flow
- Mobility models for realistic channel conditions

The LTE Multi-UE provides a number of programmable and configurable UEs that can be easily coordinated to reliably and repeatedly reproduce test scenarios. Each UE provides 3GPP LTE functionality and retains its own independent software stack to ensure that it is representative of an LTE handset.

### Aeroflex LTE Test Products

- TM500 LTE and LTE-A SUE Test Mobile
- TM500 LTE Multi-UE and extMUE Option

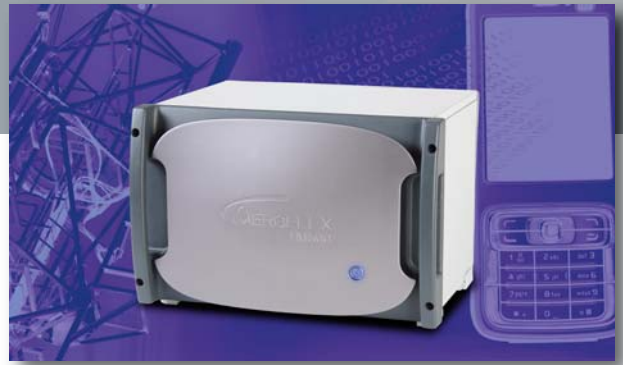


## TM500 HSPA Test Mobile Options

- 3GPP Release 7, 8 and 9 WCDMA functionality options
- HSPA+ option adds Release 7 downlink 2x2 MIMO, 64-QAM, uplink 16-QAM and enhanced layer 2 features and continuous packet connectivity features
- DC-HSDPA option adds Release 8 dual cell on the downlink, plus combined MIMO and 64-QAM on single cell
- Rel-9 DC-HSDPA adds support for simultaneous dual cell and MIMO, with downlink data rates to 84 Mbps, plus non-adjacent dual cell support
- Rel-9 DC-HSUPA adds support for dual cell in the uplink
- Planned options include Rel-10 MC-HSDPA with downlink data rates to 168 Mbps
- Single-UE options for detailed functional development and testing
- Multi-UE options for Node-B scheduler and load testing
- Higher layer protocol options add support for RRC and NAS layers, plus SIM card support

The TM500 HSPA Test Mobile products build on the successful TM500 product range adding support for the latest 3GPP release functionality on a common platform that can also run TM500 LTE software. TM500 HSPA products simplify development and test of the enhanced air interface functionality with the use of well-proven test features, including detailed user control of channel configurations and extensive logging.

Aeroflex has a roadmap for WCDMA Release 10 support and beyond to ensure that the TM500 remains at the leading edge of WCDMA development and has the functionality available to meet the most demanding Node B development schedules.



## TM500 HSPA Single-UE Options

- Full Layer 1/Layer 2 implementation of 3GPP WCDMA specifications from R99 through to Rel-9
- Simultaneous downlink data rates to 84 Mbps, plus uplink data rates to 22 Mbps
- Flexible configuration of HSUPA, HSDPA and R99 functionality
- Optional RRC and NAS, providing full protocol capabilities

## TM500 HSPA Multi-UE Option

- Focused on Node B HSPA scheduler optimization and load testing
- Release 7, 8 and 9 options
- Up to 64 HSPA UEs, simultaneous uplink and downlink
- Layer 1 and MAC-hs support of all HSDPA UE categories
- Real-time simultaneous decode of HS-SCCH/HS-DSCH data for all UEs
- Uplink Layer 1 and MAC-es functionality providing real time feedback for scheduler validation, up to Category 9
- Simulated path loss and data traffic scenarios for each UE



## Aeroflex Wireless Products

- TM500 Rel-7 HSPA+ Test Mobile Option
- TM500 Rel-8 and Rel-9 DC-HSDPA Test Mobile Options
- TM500 Rel-9 DC-HSUPA Test Mobile Option
- TM500 Rel-7 to Rel-9 Multi-UE Options
- 1, 16, 32 and 64-UE options

# Wireless Infrastructure and Cellular Parametric Test

## EAST500 Capacity Test System



The EAST500 provides true end-to-end LTE load testing over an RF connection to an LTE eNode-B (eNB). A scalable number of connected UEs are provided that can simulate from hundreds to thousands of active wireless subscribers per cell.

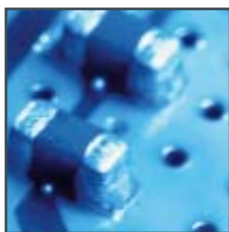
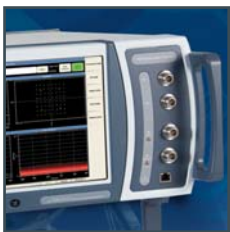
The EAST500 consists of the proven Nethawk EAST load simulation solution fully integrated with Aeroflex LTE RF technology. The use of Aeroflex's LTE RF solution provides access to the most widely deployed UE RF test solution worldwide that reduces EAST500 integration time from months to days.

### Applications

EAST500 is a highly flexible test platform that can be used for:

- eNB and LTE network load test with latest 3GPP features
- eNB and LTE network regression test
- LTE end-to-end quality of service measurement
- eNB scheduler testing under high UE load conditions
- 'Real-world' RF channels and data testing in a lab environment

Real LTE data bearer services such as VoIP calls, FTP data, web browsing and video broadcasts can be verified by using sophisticated application data generation features of the EAST500. This enables end-user quality of experience measurements to be made based upon real data application traffic.



## 7100 Digital Radio Test Set



The Aeroflex 7100 Digital Radio Test Set is a compact, benchtop instrument that provides all the tools required during the design, development and test stages of LTE UE chip sets and terminals. All the key measurements are provided for characterizing the performance of single- and multi-mode LTE, CDMA, WCDMA, GERAN and TD-SCDMA mobile devices. The 7100's easy to use test features cover the entire spectrum of R&D test activities, starting with initial RF, baseband and protocol stack development through integration, regression and pre-certification testing.

Features include:

- Comprehensive 3GPP Rel-8/Rel-9 LTE test capability
- Supports FDD and TDD, with 2x2, 4x2 and 4x4 MIMO, covering all frequency bands
- Multi-RAT testing covering LTE, WCDMA, CDMA, TD-SCDMA, GERAN including handover
- RF parametric measurements and built-in test cases
- Protocol logging and analysis tools
- Performance testing of end-to-end IP packet links, up to Cat 4
- IMS test capability, including GSMA IR.92 VoLTE support
- Built-in Fading/AWGN capability for RF performance testing under realistic signal conditions

### Covering All Phases of LTE Terminal Testing

The 7100 incorporates a 3GPP Rel-8 compliant protocol stack and physical layer to emulate an eNB (evolved Node B) and the EPC (Evolved Packet Core) network, covering all potential spectrum allocations up to 6 GHz. A comprehensive range of RF tests is included, incorporating some based on the 3GPPTS 36.521 RF test specification, covering all key transmitter, receiver and transceiver measurements. These tests use the built-in protocol stack to configure the correct RF conditions for testing. An integrated IMS server allows complete functional testing to be performed, permitting end-to-end throughput and latency to be measured in a controlled environment. The comprehensive range of test capabilities enables the 7100 to be deployed in all phases of device design and development and the ease of use and cost-effective design also make it suitable for use in the production and service markets.

## 4400 Mobile Phone Tester Series



The universal radio communication tester for production test and service test.

Aeroflex's 4400 Mobile Phone Testers are the most cost-effective test solution for those in wireless manufacturing test, service test and handset repair requiring a multi-technology platform. By quickly testing GSM, GPRS, EDGE, WCDMA (UMTS), HSDPA, 1xEV-DO and TD-SCDMA terminals, the Aeroflex 4400 provides the lowest total test cost per device and drastically reduces production downtime because one system can easily switch from one technology to another.

- Multi-standard platform for wireless handset test: GSM, GPRS, EDGE, Wideband CDMA, HSDPA, CDMA2000, 1xRTT, EVDO, TD-SCDMA
- Easy to use interface, thus minimizing training requirements
- Various PC interfaces for instrument control and data transfer; GPIB, LAN, USB, RS-232

## 4914 Antenna Coupler

Simplifying testing of PMR radios and CDMA 450 mobile phones.

The Aeroflex 4914 Antenna Coupler makes testing of PMR terminals easier. Where technicians previously had to move around many RF adapters (radio frequency adapters) for different types of equipment, they now can simply place the unit under test on the 4914 Antenna Coupler, adjust the shuttle to a predefined position and start the test. Using a coupling device with an antenna has the additional advantage of including the antenna in the test whereas individual adapters are often connected in place of the antenna or with a connector that bypasses the antenna.

- Easy to use – no complicated wiring and handling
- Unique moving shuttle ensures best coupling position
- High repeatability using snap-in (preset) positions
- Optimized for use with Aeroflex's 4921 RF Shield

## Aeroflex Wireless Products

- 7100 Digital Radio Test Set
- EAST500 Capacity Test System
- 4400 Mobile Phone Tester Series



## 8300 Griffin Fast Measurement Receiver

For Planning and Optimizing Cellular Networks

Aeroflex's 8300 Griffin Fast Measurement Receiver is the ideal instrument for quickly and accurately performing a wide range of measurement functions in the RF channel. Using the latest RF and logic technologies, the Aeroflex 8300 is the most effective measuring receiver available for planning and optimizing cellular networks.

- Portable, robust and battery-powered unit; ready for use in any environment
- Range of measurement modes: field surveying, spectrum analysis and spectral occupancy to statistical measuring of the RF channel
- Verifies RF propagation/RF coverage, and detects interference

## 7310 Lector and Scriptor Family



Easily managing complex measurements

Aeroflex's 7310 Lector software is a well-established and economic test solution for service centers and repair shops testing returned mobile phones with any of Aeroflex's terminal testers.

- Supports many Aeroflex Terminal Testers
- Supported technologies: GSM, GPRS, EDGE, WCDMA, HSDPA, CDMA2000, EVDO, AMPS, TETRA, Bluetooth®, WiFi (Wireless LAN)

- 4914 Antenna Coupler
- 8300 Griffin Fast Measurement Receiver
- 7310 Lector and Scriptor Family

# Wireless

## R&D and Conformance Test

### 6204 and 6402 CDMA-AIME - CDMA Mobile Protocol Development and Conformance Test Solutions



- Support for cdma2000 1X, EV-DO Rel 0/Rev A radio standards
- Multi-cell emulation including Hybrid Mode (1X / EV-DO) and SVDO
- Advanced test options - Mobile IP, A-GPS, internal digital baseband fading and AWGN
- Fully automated testing including mobile control

The CDMA-AIME system is designed to enable testing of cdma2000 1X, EV-DO release 0 and EV-DO revision A mobile devices and access terminals. Applications include R&D, software development, mobile integration, regression testing, interoperability testing, operator test plans and conformance testing against the CCF-L test plan.

An extensive range of 3GPP2/CCF test cases are available as separate software options offering a scalable cost effective CDMA test solution.

### 6113 EDGE Base Station Test Set



- Field portable, easy to use, fully integrated for GSM 850, 900, 1800 and 1900 BTS testing
- Options to control all major BTS types
- Test sequences for full customization
- Optimized for installation and commissioning, routine maintenance, fault finding and production testing
- A-bis interface for full BTS control and Bit Error Ratio (BER) measurements
- Two PC card slots for data storage, field upgrades and software enhancements
- Options for GPRS, EDGE and AMR base station tests

Aeroflex's 6113 Digital Radio Test Set is regarded by many as the industry standard base station tester, and it provides a wide range of test and measurement functions to enable fast manual or automatic testing of GSM 850, 900, 1800 and 1900 Base Transceiver Stations (BTSs). Applications include installation and commissioning, routine maintenance, fault finding and final unit production testing.

The A-bis interface also allows the user to make Bit Error Ratio measurements (BER) on the receiver and transmitter, as specified in GSM rec, 11-20/11-21. The 6113 A-bis interface also permits a wide variety of other test functions to be performed that could not otherwise be implemented.

### Aeroflex Wireless Products

- 6204 and 6402 CDMA-AIME
- 6113 EDGE Base Station Test Set
- 6103 AIME and 6103 AIME/CT



## 6103 AIME and 6103 AIME/CT - 2/2.5G Mobile Protocol Development and Conformance Test Solutions



- GSM, AMR, GPRS, EGPRS and DTM
- 3GPP TS51.010 test cases validated by accredited test houses
- Fully automated testing including mobile control
- Fast test case execution times
- Quad band capable: 850, 900, 1800 and 1900 MHz
- Support for UMA/GAN Handover (GSM/WiFi)

The 6103 AIME and 6103 AIME/CT platform supports GSM, AMR, GPRS, EGPRS and DTM in excess of multi-slot class 12.

6103 AIME is used for initial DSP development, protocol stack R&D, integration, interoperability identification and regression test. The 6103 AIME can be upgraded to the 6103 AIME/CT, a fully compliant 3GPP conformance test solution, listed at GCF and PTCRB as Test Platform TP11.

The 6103 AIME/CT is aimed at the latter stages of the terminal development lifecycle, addressing compliance, a mandatory testing process prior to market launch of 2/2.5G terminals. The AIME/CT software allows the user to execute validated GSM, AMR, GPRS, EGPRS and DTM 3GPP TS51.010 conformance test cases. The 6103 AIME and AIME/CT support 3GPP Releases R97/8, R99, Rel-4, Rel-5 and beyond, securing its place as the 2/2.5G protocol analyzer and compliant conformance test solution of choice for many years to come.



# Avionics Test

Aeroflex's avionics test equipment is used to design, manufacture, test and maintain commercial, private and military airborne electronic systems. With the quality and performance you have come to expect from Aeroflex, our avionics test solutions provide the critical data needed to ensure a safe flying environment. Aeroflex has been the industry leader in avionics testing for more than 40 years and continues to lead with innovative solutions.

## GPSG-1000 Portable Satellite Simulator



The GPSG-1000 uses modular technology for RF and baseband signal generation to produce highly accurate and repeatable test results. Unlike bench top simulators, Aeroflex's approach also allows the test system to be easily upgraded.

Some of the many features of the GPSG-1000 include:

- Simulation of GPS L1C, L2C, L5 signals, supporting the modernization of signals used by the latest designs of GPS receivers
- Simulation of Galileo E1, E5, E6 signals to support unencrypted services
- SBAS, WAAS/EGNOS L1, L5 for automatic SBAS simulation
- Built-in GPS C/A code receiver for automatic GPS almanac download
- Dynamic waypoint navigation, a 3D navigation scheme that allows airport-to-airport flight plan simulation
- Programmable satellite parameters allow specific tests to be conducted to determine receiver behavior under degraded or invalid signal conditions
- Available in 6 or 12 channel configuration

## ALT-8000 FMCW/Pulse Radio Altimeter Flightline Test Set



The ALT-8000 is a lightweight universal test set for 4.3 GHz FMCW (frequency modulated continuous carrier wave) radio altimeters and pulse radio altimeters with a large 12-inch color touch screen for ease of use. The ALT-8000 may be directly coupled to the radio altimeter transmitter/receiver (TX/RX) ports or may be connected via supplied TX/RX antenna couplers. Problems are identified with a positive diagnosis and a confirmed resolution, reducing NFF (no fault found) occurrences and reducing the airline LRUs (line replaceable units) inventory.

- Tests FMCW radio altimeters including CDF types
- Tests pulse radio altimeters (non-pulse compression types)
- Direct-connect to UUT T/R or to installed system via antenna couplers
- Ratio-metric RF loop test allows TX, RX, antenna or feeder faults to be identified
- Multi-channel operation (via additional test sets)
- Programmable multi-leg climb/descend profiles
- Remote control interface USB/LAN



"...Aeroflex has been the industry leader in avionics testing for more than 40 years..."

## Aeroflex Avionics Test Products

### Trans, Inter, DME, TACAN and TCAS Testers

- APM-424(V)4 & APM-424(V)5 Interrogator/Transponder Test Set
- IFF-45TS Transponder/Interrogator/TACAN Bench Test Set
- IFR 6000 Ramp Test Set
- IFR 6015 Military Ramp Test Set
- SDX 2000 Transponder/Interrogator/DME Test Set
- ATC-1400A Transponder/DME Bench Test Set
- T-1401 TACAN Accessory Unit
- S-1403DL/MLD Mode S Accessory Unit
- SI-1404 MK12/Mode S IFF Accessory Unit
- IFF-701Ti IFF Transponder/Interrogator Test Set
- RGS 2000 TCAS Reply Generator

### IFR 6000 Ramp Test Set



- One main user screen for each test mode
- Detachable antenna
- Simple user interface
- Lightweight and compact under 8 lbs.

The IFR 6000 tests transponder modes A/C/S Mode S Level 1-4, FAR Part 43 Appendix F Compliant (Enhanced Surveillance) + Proposed FAR Part 43 Appendix F Extension. It also tests DME TCAS I and II. It features an extremely easy to use interface where every parameter the user commonly needs to view is displayed on one screen. The IFR 6000 is everything you need for comprehensive DME testing supporting all DME channels. Interfaces include RS-232, USB, antenna, RF I/O, interrogation and reply monitor BNC and altitude decoder.

### IFR 4000 Nav/Comm Ramp Test Set



- Accurate measurement of VHF/UHF transmitter, frequency, output power, modulation (AM and FM and receiver sensitivity)
- Generation of ARINC 596 selective calling tones
- Guided test capability cuts down total test time

The IFR 4000 navigational communications ramp test set verifies the operation and installation of ILS, VOR and Marker Beacon receivers and VHF AM/FM and UHF AM transceivers. The IFR 4000 with its lightweight size (under 8 lbs.), long run time battery (8 hrs.) and ergonomic design will provide you with the most portable navigational communications ramp test set on the market today.



### APM-424(V)4 and APM-424(V)5 Interrogator/Transponder Test Sets



#### APM-424(V)5 Mode 5 Test Set

Nsn: 6625-01-583-2774

- DoD AIMS 03-1000A Mark XIIA (Mode 5 Level 1 and 2) certification
- Transponder Test Modes 1, 2, 3/A, C, S (ELS/EHS, 4, Mode 5)
- Interrogator Test Modes 1, 2, 3/A, C, S, 4, Mode 5, TCAS, E-TCAS
- Shipboard interrogation

#### APM-424(V)4

- Transponder Test Modes 1, 2, 3/A, C, S (ELS/EHS, 4)
- Interrogator Test Modes 1, 2, 3/A, C, S, 4, TCAS, E-TCAS
- Shipboard interrogation
- Mode 5 upgradeable

Aeroflex's new generation Interrogator/Transponder Test Sets maintain the preferred point and shoot design for ease and speed of operation. These test sets meet or exceed U.S. Military requirements for safety and environmental conditions.

#### Nav/Comm Testers

- IFR 4000 Nav/Comm Ramp Test Set
- ATB-7300 Avionics Test Bench

#### Radio Altimeter Testers

- ALT-8000 Radio Altimeter Test Set

#### MLS, Weather Radar and GPS Systems

- MLS-800 Microwave Landing System/Ground Station Simulator
- MLS-801 Microwave Landing System Ramp Test Set
- RD-301A Weather Radar Test Set
- RDX-7708 Weather Radar Test Set
- GPS-101 Satellite Simulator
- GPSG-1000 Portable Positional Simulator

# Avionics Test

## IFF-45TS Transponder/Interrogator/TACAN Bench Test Set



- AIMS certified (All modes including Mode 5)
- Dual I/O for diversity transponder or sum/difference interrogator testing
- Separate RF I/O for direct connection to equipment under test or connection to antennas for over-the-air testing
- Supports AIMS 04-900 Type A (KIV-78) and Type B (KIV-77) Mode 4/5 cryptographic equipment

## PSD90-1C AC/DC Fuel Capacitance Test Set



- Easy to operate/calibrate
- Closed box calibration using front panel controls - performed annually
- Lightweight/portable
- Re-chargeable battery or externally powered

The PSD90-1C AC/DC Fuel Capacitance Test Set will test any AC or DC capacitive fuel, water, LOX or engine oil or other AC capacitance system. The PSD90-1C has new features that allow the user to better troubleshoot and isolate fuel system problems. Rugged in design, the unit can be used anywhere troubleshooting is required. Capable of being operated with external power, the PSD90-1C is ideal for shop or depot level repair of fuel system components.

## PSD60-2R Fuel Quantity Test Set



- Measurement of total tank capacitance, individual tank units and compensators
- Simulation of capacitance for indicator calibration
- Simulation of compensator capacitance value for dry calibration

The PSD60-2R is an accurate, highly reliable, portable capacitance test set. Along with an aircraft specific interface, the PSD60-2R will test any AC capacitive fuel, water, LOX, engine oil or other AC capacitance system.

## ATB-7300 Avionics Test Bench



ATB-7300 Avionics Test Bench is a configurable platform for avionics test.

- Designed for use in product development, prototype, certification, factory test and service
- Avionics signal generation and signal analysis tools in a single chassis
- Tests ILS/VOR/MKR/ADF and VHF comm functions, including SELCAL

Avionics Test Bench is a comprehensive, configurable test platform for avionics system and component test. The basic unit, ATB-3000, is a powerful bench PXI avionics signal generator, complete with Aeroflex integrated PC controller and touch screen display. Options include RF avionics waveform analyzer and integral spectrum analyzer.

### Databus Analyzers and Control Display Units

- 429EX ARINC 429 Analyzer
- DT200 ARINC 429 Analyzer
- DT350H Honeywell ASCB Analyzer
- DT400 ARINC 429 Analyzer
- DT400H ARINC 429 Analyzer
- T1200B ARINC 429 Control Display Unit

### Fuel Quantity Testers

- PSD30-2AF Universal DC Capacitance Test Set
- PSD60-1AF AC Capacitance Field Calibration Unit
- PSD60-2R Fuel Quantity Test Set
- PSD90-1C AC/DC Capacitance Test Set



## RF Expansion Module for ATEC® Series 6 ATE



The RF Expansion Module (RFEM) is a new product capability designed to support testing of airborne RF components on the ATEC® Series 6 ATE. Developed and manufactured by Aeroflex in partnership with the Test & Services activities inside Cassidian, the RFEM provides a convenient platform that is completely compatible with new and existing ATEC® Series 6 ATE systems that use the Cassidian test executive environment.

- Aeroflex designed RF test system, fully integrated into the ATEC® Series 6
- Simple Ethernet interface between RFEM and ATEC® Series 6, permits easy retrofit to existing ATE installations
- Cassidian test executive interface offers many advantages to the test operator
- Global service and support provided jointly by Cassidian and Aeroflex
- Extensive CMM-listed TPS library in development or planned, covering Nav, Comm, TCAS, Transponder, SATCOM, GPS, and other RF systems
- Complete RFEM and TPS information can be consulted on the Cassidian Customer Support and Services MyATE Internet web site
- Our objective is to offer test coverage of RF products from all major OEMs



### ATE Systems

- IRIS 2000 General Purpose ATE System
- IRS 1200 Inertial Reference Unit Test System
- RF Expansion Module for ATEC® Series 6 ATE

# S-Series

The S-Series is a range of cutting-edge RF test equipment. This class-leading, Windows™-based, totally touch-screen RF product range employs the latest synthesizer technology providing excellent phase noise combined with fast frequency and level settling time.

The S-Series instruments employ a large touch-screen user-interface to provide unparalleled ease of use. The small form-factor and light weight ensure minimum footprint on the bench or test system and maximum portability.

Feel confident in your RF test needs - by combining instruments and modules using our innovative AeroLock™ concept, the S-Series safeguards your future.

The S-Series products have been designed to cater for the needs of RF engineers who not only need high quality RF signal sources but also need the speed and efficiency provided by the newer generation equipment.

## SGA - Fast, Low Noise Analog Signal Generator



- Frequency coverage 100 kHz to 6 GHz
- Phase noise -135 dBc/Hz
- RF level/freq setting times 100 µs

With the unique combination of low phase noise and fast settling times, the SGA sets a new standard for performance. With four internal 10 MHz oscillators and two external inputs, a wide selection of modulation modes is catered for with wide bandwidths to support testing of broadcast systems and FSK for high speed digital transmission and telemetry, as well as a fully featured avionics option. A fast pulse modulator/generator option supports demanding tests on radar RF and IF stages required for military and RF applications.

## SGD - Fast, Low Noise, Digital Signal Generator



- Frequency coverage 100 kHz to 6 GHz
- +13 dBm output (+20 dBm option)
- IQ modulator with 300 MHz RF bandwidth
- Up to 250 MS/s dual channel arbitrary waveform generator with memory options up to 4 GBytes (1G Sample)
- 3GPP ACLR of -71 dB
- Embedded IQCreator® waveform generation tool
- Low SSB phase noise: -135 dBc/Hz at 1 GHz
- Fast frequency settling time: 100 µs
- List mode with AWG waveform sequencing

With a comprehensive range of features and options, the SGD meets the needs for a general-purpose signal generator while offering the high performance required of demanding, critical receiver measurements or rapid manufacturing. The wide bandwidth IQ modulator is complemented by an embedded version of IQCreator®, Aeroflex's powerful waveform creation tool. This enables a user to design waveform files from simple generic or system specific templates as well as convert user designed waveforms into compatible formats.

Waveforms designed in IQCreator® can include signal impairments and time markers to aid synchronization. Graphical displays of the waveform FFT, vector and constellation diagrams, etc. can be viewed and exported for use in other Windows™ applications.

### S-Series

- SGA - Fast, Low Noise Analog Signal Generator
- SGD - Fast, Low Noise, Digital Signal Generator
- SVA - Vector Signal Analyzer
- SCO - 4-Input Port Combiner
- SPA - High Power Amplifier

## SVA - Vector Signal Analyzer



- Frequency coverage 250 kHz to 13 GHz
- Input level range to +30 dBm
- Maximum instantaneous bandwidth: 90 MHz
- Digitizer ADC resolution: 13 bits
- Digital downconverter with sample rates up to 250 MS/s
- List mode for fast frequency and level settling time: <250  $\mu$ s
- Generic demod and spectrum analysis as standard

The SVA converts RF signals into digital IF or I&Q sampled data providing vector signal analysis of RF signals with functionality and performance required in the laboratory or the manufacturing test system. With high linearity, low noise and excellent level accuracy, the SVA is ideally suited for the analysis of WLAN, WMAN, WPAN, 2G, 3G, 4G cellular radio signals as well as general purpose analog and digitally modulated signal analysis. A spectrum analyzer mode provides the features and controls you would expect from a conventional spectrum analyzer.

A dual display mode allows close-in analysis of FFT segments using a simple drag and drop technique.

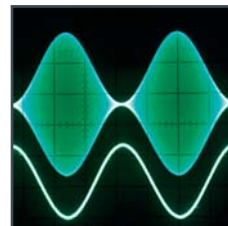
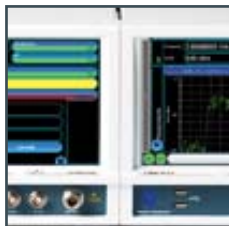
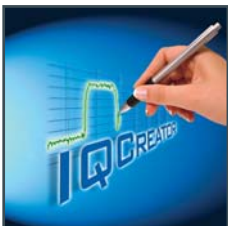


## SCO - 4-Input Port Combiner

- Wide band cover
- SCO-6 - 1 MHz to 6 GHz
- Plug & Play operation under the control of an SGA/SGD simplifies test configuration and calibration
- Aerolock™ interlocking mechanism for test system creation
- Combine the outputs of up to four SGA/SGD signal generators to support all multisource applications

High performance 4-input combiner/switch module to complement the SGA/SGD signal generator for all multisource applications.

[www.aeroflex.com/sseries](http://www.aeroflex.com/sseries)



# Signal Sources

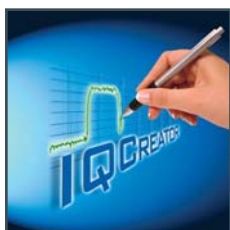
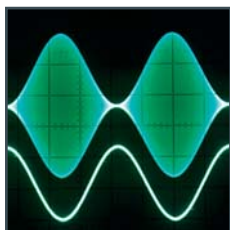
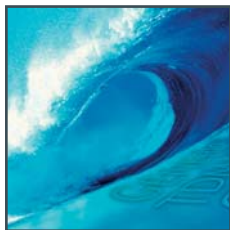
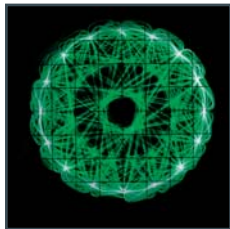
## Signal Generators

Inheriting Marconi Instruments' reputation for quality, reliability and innovation, Aeroflex retains patents and intellectual property improving signal generation throughout the industry. An example is Fractional-N synthesis technology necessary to produce high-resolution, low phase noise carrier signals in signal sources.

In turn, Aeroflex develops and executes its entire line of signal sources with excellent phase noise characteristics plus exceptionally high output power with class-leading output VSWR.

Combining the quality of Aeroflex signal sources, their reliability, excellent price/performance ratios, conservative specifications and minimal requirements for maintenance, every Aeroflex test system represents an outstanding lifetime value.

Aeroflex's signal sources are applicable to a diverse marketplace that includes wireless cellular, avionics, military and radar. Fast switching, low phase noise, wide bandwidth, adjacent channel power and memory deep enough to support complex waveforms continue to be key attributes within the signal sources product line offered by Aeroflex.



| 2023A Series | 2026A Series | 2030 Series     | 2040 Series     | SGA S-Series    | 3410 Series                 |  |
|--------------|--------------|-----------------|-----------------|-----------------|-----------------------------|--|
| (3002 VXI)   | MultiSource  | Advanced Analog | Low Phase Noise | Advanced Analog | Digital RF Signal Generator | Primary Application  |
|              |              |                 |                 |                 |                             | Receiver: sensitivity adjacent channel, Blocking, spurious response, SINAD |
|              |              |                 |                 |                 |                             | Amplifier: intermodulation, 1 dB compression testing                       |
|              |              |                 |                 |                 |                             | Mixers, filters, component characterization                                |
|              |              |                 |                 |                 |                             | Avionics ILS/VOR/DME   |
|              |              |                 |                 |                 |                             | Wireless product test  |
|              |              |                 |                 |                 |                             | EMC  |
|              |              |                 |                 |                 |                             | TETRA  |
|              |              |                 |                 |                 |                             | Paging   |
|              |              |                 |                 |                 |                             | Modulation Modes   |
|              |              |                 |                 |                 |                             | 2G (CDMA, GSM, NADC, PDC, PHS)   |
|              |              |                 |                 |                 |                             | 2.5G (EDGE)  |
|              |              |                 |                 |                 |                             | 3G (cdma2000, WCDMA)   |
|              |              |                 |                 |                 |                             | WLAN (Bluetooth®, IEEE 802.11a, b & g)                                     |
|              |              |                 |                 |                 |                             | WMAN (802.16e OFDM, OFDMA)   |
|              |              |                 |                 |                 |                             | TETRA  |
|              |              |                 |                 |                 |                             | APCO P25, IDEN   |
|              |              |                 |                 |                 |                             | Digital vector modulation  |
|              |              |                 |                 |                 |                             | Option Features  |
|              |              |                 |                 |                 |                             | High Power   |
|              |              |                 |                 |                 |                             | High Stability Frequency Standard  |
|              |              |                 |                 |                 |                             | Second Modulation Oscillator   |
|              |              |                 |                 |                 |                             | List Mode  |
|              |              |                 |                 |                 |                             | Avionics   |
|              |              |                 |                 |                 |                             | DME  |
|              |              |                 |                 |                 |                             | Pulse Generator  |
|              |              |                 |                 |                 |                             | RF Profile / Complex Sweep   |
|              |              |                 |                 |                 |                             | Electronic Attenuator  |
|              |              |                 |                 |                 |                             | Mechanical Attenuator  |
|              |              |                 |                 |                 |                             | Fast Pulse Modulator   |
|              |              |                 |                 |                 |                             | SINAD  |
|              |              |                 |                 |                 |                             | Dual Arbitrary Waveform Generator  |
|              |              |                 |                 |                 |                             | Differential I/Q Analog Outputs  |
|              |              |                 |                 |                 |                             | Real Time Baseband   |

DIGITAL

ANALOG



## 3410 Series Digital RF Signal Generators



- Frequency coverage 250 kHz to 6 GHz
- Fast RF frequency settling <500  $\mu$ s
- Fast level setting time <3 ms
- Waveform switching time <5 ms
- Differential IQ outputs
- Optional dual-channel arbitrary waveform generator
- Exceptional modulation linearity and speed

With its uncompromising levels of RF performance, the 3410 Series is the ideal tool for RF test applications in both R&D and manufacturing.

Combining full digital, vector and analog modulation in a 2U rack size, the 3410 offers broadband modulation bandwidth, fast GPIB response time, high output power, differential IQ outputs and excellent modulation accuracy and linearity.

### IQCreator® Waveform Creation Software

Designed for use with Aeroflex's 3410 Series digital RF signal generators. IQCreator® is a free, easy to use, Windows™-based software application that enables a user to set up a modulation scheme and then create an AWG (Arbitrary Waveform Generator) file.

Download the latest version at [www.aeroflex.com/IQCreator](http://www.aeroflex.com/IQCreator).



## 2023A Series Signal Generators



Renowned around the world for its combination of flexibility, reliability and performance, the 2023A Series signal generator continues to offer fantastic value and excels in the following areas:

- Phase noise performance
- Class leading VSWR
- Highest power option +25 dBm
- Unique SINAD measurement option for simplified receiver testing
- Unique DC power input option for use in vehicle or external supply in the field
- Fast pulse modulator option with internal pulse generator
- 2026 multisource variant

...and at 8 kg (17.6 lbs.) is still one of the lightest and most portable signal generators in its class.

## Aeroflex Signal Generator Products

- S-Series SGA Signal Generator
- S-Series SGD Signal Generator
- 2023A/B/25 Signal Generators
- 2026A/B Multi-Source Signal Generators
- 2030/40/50/T Signal Generators
- 3412/3/4/6 Digital RF Signal Generators
- 3002 VXI Signal Generator

# Signal Sources

## Fast Switching Synthesizers

How did Aeroflex fast-switching synthesizers get to be #1? It's no mystery. First, we build the best products. Our Synthesizers, in fact, have it ALL-high speed, low noise and wide bandwidth in one package.

We also put together a full range of models with all the options you'd ever need. And of course, we made them modular, so we could customize them to meet any performance requirements, from commercial to full military airborne and shipborne applications, for radar to EW to simulator to commercial test applications.

Every year we add to the more than 5,000 Aeroflex synthesizers installed around the world, which continue to satisfy our customers needs.

### 2200 Fast Switching Synthesizers

The 2200 Series is built on a versatile modular platform offers one microsecond switching speed and sub-microsecond level correction, coupled with superb spectral purity.

Designed to save substantial time and money over building a custom system in-house, the 2200 Series is used for airborne, shipborne, electronic warfare simulation, radar upgrades and other stringent applications where the highest performance is required for rugged environments.

The 2200 Series is ideal for radar simulation, radar cross-section measurements, antenna pattern measurements and other high-speed microwave and RF applications.

- Spans frequency range from 10 MHz to 18.4 GHz
- Broadband sources operating over the range of 10 MHz to 18.4 GHz with a standard resolution of 1.0 Hz
- Can step from any frequency (F1) to any other frequency (F2), up or down in  $\leq 1$   $\mu$ Sec
- Output amplitude is +10 dBm  $\pm 2$  dB into an impedance of 50  $\Omega$
- Full 3U rack chassis
- Excellent phase noise and spurious

### 2500 Fast Switching Synthesizers



- Truly modular construction
- Wide frequency range from a single unit
- Amplitude levelling
- Hop states faster than 5 Megahop/sec
- Wide variety of standard and custom interface options

The Aeroflex 2500 Series synthesizers feature superior performance. The 2500 Series synthesizers are reliable, ultra-fast, exceptionally clean and low cost. They are an ideal source for FM chirpable, agile radar, radar simulators, radar upgrades, fast antenna, RCS measurements, electronic warfare systems and ultra-fast ATE. The high-speed source is based on direct-synthesis techniques with generous use of sharp roll off bandpass filters for low-spurious performance.

- Spans frequency range from 300 MHz to 18 GHz (optional up to 40 GHz)
- Broadband sources operating over the range of 3 MHz to 18 GHz with a standard resolution of 1.0 MHz with optional 1 Hz resolution available
- Can step from any frequency (F1) to any other frequency (F2), up or down in  $< 200$  nsec.
- Output amplitude is +10 dBm  $\pm 2$  dB into an impedance of 50  $\Omega$
- Full 3U rack chassis
- Excellent phase noise and spurious

### Custom Synthesizers

We also design and manufacture many of the highest performance synthesizers in the world for various critical shipboard and airborne applications. These synthesizers are custom-designed to reliably achieve our customer's challenging performance requirements in legacy systems as well as the most advanced systems in the world. Contact us to discuss your custom requirements.

[www.aeroflex.com/synthesizers](http://www.aeroflex.com/synthesizers)

### Aeroflex Fast Switching Synthesizer Products

- FS1000/1200/2000/5000 Frequency Synthesizers
- MS5000 Airborne Frequency Synthesizer
- 2106 Frequency Synthesizer
- 2126 Frequency Synthesizer
- 2200 Series of Frequency Synthesizers
- 2500 Series of Frequency Synthesizers

## Integrated Microwave Assemblies (IMAs) and Multi-Function Modules

Continuing its heritage of broadband, fast switching, low noise products, Aeroflex continues to expand its portfolio of high performance RF and Microwave multi-function modules and integrated subsystems for applications ranging from the laboratory to space, with particular focus on airborne applications. Our modern design and manufacturing approaches provide the optimal combination of reliability, high performance, small size and low cost.

Our years of proven engineering and manufacturing experience with the many diverse RF and microwave design disciplines required in our existing products allow us to satisfy requirements for our military, space and commercial customers without compromise.

### Experience

- A proven supplier of RF and microwave hardware for decades

### Commitment

- Substantial personnel, technology and capital resources
- Substantial investments in facilities, research and product development

### Results

- Hundreds of systems and multi-function modules supplied on major programs
- Aggressive cost and schedule control experience on volume requirement



Aeroflex has been a major supplier for standard and custom design products for the world's most demanding defense and commercial applications and environments.

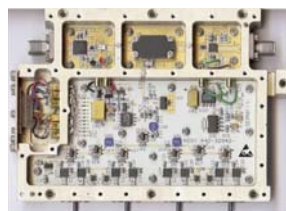
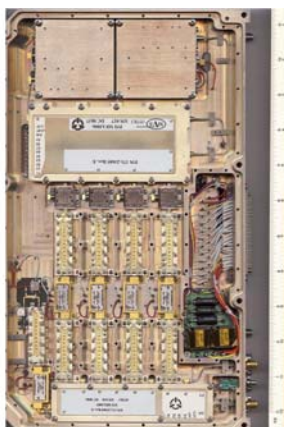
Customers choose Aeroflex's IMAs based upon our:

- Low phase noise, fast-switching heritage
- Broadband, low spurious and harmonics capabilities
- Wide range of design and manufacturing technologies
- Cost-effective compliance for various harsh environments
- Strong combination of system-level and component-level design expertise, which enable superior IMA design that meets the most demanding customer specifications
- Decades of experience as a world class supplier of high reliability microwave and RF IMAs

Categories of RF Modules and typical IMAs we have recently manufactured include:

- Frequency converters
- Frequency generators
- Frequency multipliers
- Up/Down converters
- Receivers
- Switch matrix assemblies
- High performance oscillators
- Digitally controlled oscillators (DCXOs)
- Custom frequency synthesizers

[www.aeroflex.com/imas](http://www.aeroflex.com/imas)



# Spectrum Analyzers

## Spectrum Analyzers

### Spectrum Analyzers

Advanced performance and exceptional capabilities at affordable pricing.

### 3250 Series Spectrum Analyzers



- Powerful RF performance, phase noise -115 dBc/Hz, DANL -145 dBm/Hz
- Standard 30 MHz I/Q demodulation bandwidth
- Measurement personality options including GSM/EDGE, UMTS, CDMA2000/1xEVDO, WLAN and WiMAX1
- Remote control via LAN, GPIB, RS-232C
- S/W extension based on Windows® XP OS
- 7" wide touch panel display
- Standard removable hard disk
- Optional battery and DC input
- Optional 3 GHz and 8 GHz tracking generator - all models
- Portability based on light and compact design

The 3250 Series provides market leading performance at a low cost. The innovative compact design 3250 spectrum analyzer employs the latest digital processing and RF technology, providing accomplished accuracy, stability and measurement speed.

To support the constantly evolving wireless communication market, the 3250 incorporates a standard 30 MHz bandwidth digitizer and basic digital modulation analysis S/W. The instrument has been optimized for various mobile and wireless communication measurements such as GSM/EDGE, UMTS, WiMAX and WiBro.

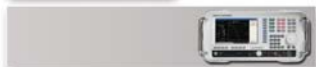
With its powerful RF performance and advanced applications the 3250 Series is ideally suited for RF development, design analysis and testing. All models have a Windows® XP operating system, remote control capabilities via LAN, GPIB and RS-232C as well as a 7" touch panel screen, ensuring ease of operation and exceptional connectivity.

**3251**



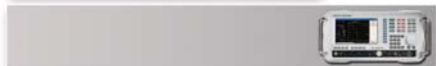
**1 kHz to 3 GHz**

**3252**



**1 kHz to 8 GHz**

**3253**



**1 kHz to 13.2 GHz**

**3254**



**1 kHz to 26.5 GHz**

### Aeroflex Spectrum and Signal Analyzers Products

- 3250 Series Spectrum Analyzers
- 9100 Series Spectrum Analyzers
- SOFTPLOT Application Software
- SVA Vector Signal Analyzer



## 9100 Series Hand-held Spectrum Analyzers

The 9100 Series - Rugged design for field and lab applications



The 9101 Hand-held Spectrum Analyzer provides RF engineers with the excellent performance of a workbench analyzer in a hand-held form, at a competitive price.

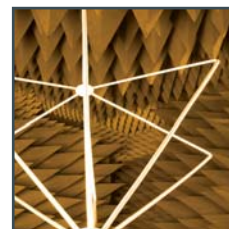
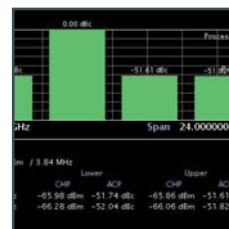
- 100 kHz - 4 GHz frequency range
- Used in the field to measure and verify base station emissions
- Used for installation trouble-shooting, repair and maintenance e.g. in wireless local loop and modern 2.4 GHz WiFi systems

## 9102 and 9103 Spectrum Analyzers

- Covering all applications in a frequency range up to 7.5 GHz. Low phase noise DANL -130 dBm
- Supporting radiation measurements at base stations and broadcast transmitters
- Ideal for cable and antenna test and mobile service and repair
- Applicable for commissioning, installation, maintenance and manufacturing
- Allows external reference connection for highest frequency accuracy
- Assessment and verification of electromagnetic radiation to verify measures against EMI

The 9102 and 9103 hand-held spectrum analyzers provide RF engineers and service technicians with the excellent performance of a workbench analyzer, but with a hand-held form factor for a competitive price.

Typical measurements include transmitter testing, alignment of modulator and measuring switch breakthrough. Additional options; such as a tracking generator, the 9160 VSWR/DTF bridge and the 9103 VSWR/DTF reflection measurement option; expand the capabilities of the 9102 and 9103.



### RF Modular Instruments (PXI)

The Aeroflex 3000 Series expands PXI's speed and modularity into the realm of general-purpose wireless testing. Multi-standard testing in a single box solution is now achievable with no compromise in performance.

The built-in flexibility of the PXI approach allows the 3000 Series to support a variety of application areas. It is particularly suited to modern cellular and wireless data communications and critical testing in a high volume manufacturing environment. The modules are categorized into groups: stimulus, response and signal conditioning, which are combined with test software to produce fast, accurate test solutions that are future-proof and cost effective.

The PXI Studio software application enables the 3000 Series to be used for GSM/EDGE, UMTS/HSPA, LTE, CDMA 2000 and 1xEV-DO, TD-SCDMA, WiMAX, WLAN and Bluetooth® device testing in addition to generic modulation analysis.



### 3010/3011 PXI RF Synthesizers

The 3010/3011 RF synthesizer modules are high performance frequency synthesizers. Using Aeroflex patented technology, the modules provide 1 Hz frequency resolution combined with excellent phase noise performance and frequency agility all in a single width 3U module.

### 3020 Series PXI Digital RF Signal Generators

The high-performance 3020 Series signal generator modules can be used for both continuous wave (CW) and digital signal generation for device testing and characterization up to 6 GHz with an RF output level ranging from -120 dBm to +17 dBm.

The IQCreator® signal generation application enables the design of digital modulation and other complex waveforms. Comprehensive modulation capability is provided including internal analog AM/FM, digital and IQ vector modulation modes.

|                                       | 3020A   | 3025                                     | 3020C                        | 3025C         | 3021C           | 3026C         |
|---------------------------------------|---|--|------------------------------|---------------|-----------------|---------------|
| Frequency Range                       | 250 MHz-2.7 GHz   | 76 MHz-6 GHz                             | 250 kHz-3 GHz                | 250 kHz-6 GHz | 100 kHz to 3GHz | 250 kHz-6 GHz |
| Frequency Resolution                  | 1 Hz, (2 Hz above 3 GHz)                                      |  |                              |               |                 |               |
| Output Level (minimum)                | -120 dBm  |  |                              |               |                 |               |
| Output Level (maximum <3 GHz)         | +5 dBm  | +5 dBm                                   | +6 dBm                       | +6 dBm        | +17 dBm         |               |
| Output Level (maximum >3 GHz)         | NA  | 0 dBm                                    | NA                           | +1 dBm        | +17 dBm         |               |
| Level Resolution                      | 0.01 dB   |  |                              |               |                 |               |
| Level Accuracy                        | 0.3 dB typ, 1.0 dB above 3 GHz                                |  |                              |               |                 |               |
| Settling Time (Frequency)             | <250 μs   |  | <250 μs, <85 μs below 85 MHz |               |                 |               |
| Settling Time (Level)                 | <250 μs   | <3 ms below 4.5 GHz, <4 ms above 4.5 GHz |                              |               |                 |               |
| Phase Noise (<50 MHz) @ 20 kHz offset | NA  |  | -143 dBc/Hz                  |               |                 |               |
| Phase Noise (2 GHz) @ 20 kHz offset   | -115dBc/Hz  |  |                              |               |                 |               |
| Phase Noise (5 GHz) @ 20 kHz offset   | NA  | -108 dBc/Hz                              | NA                           | -108 dBc/Hz   | NA              | -108 dBc/Hz   |
| Modulation                            | CW/AM/FM/I&Q/Digital  |  |                              |               |                 |               |
| Signal Bandwidth                      | 28 MHz  |  | up to 90 MHz                 |               |                 |               |
| AWG Sample Rate                       | 66 MSa/s  |  | 200 MSa/s                    |               |                 |               |
| AWG Sampe Resolution                  | 16 bit  |  |                              |               |                 |               |
| AWG Sample Memory                     | 32 Mbyte  |  | up to 2 GByte                |               |                 |               |
| Analog I&Q Outputs                    | Yes (optional, single ended/differential)                     |  |                              |               |                 |               |
| I&Q Vector Modulation Inputs          | Yes   |  |                              |               |                 |               |
| Triggering                            | TTL, Data I/O, Star Trigger, Trigger Bus, Local Bus, Software |  |                              |               |                 |               |
| Real time digital IQ Interface        | Yes (LVDS)  |  |                              |               |                 |               |
| Slots Occupied                        | 2   |  |                              |               | 3               |               |
| Slot Type                             | PXI 1   |  | PXI Hybrid slot compatible   |               |                 |               |

### Aeroflex PXI Products

- 3010/3011 PXI RF Synthesizers
- 3020A PXI 2.7 GHz RF Signal Generator
- 3020C PXI 3 GHz RF Signal Generator
- 3021C PXI High Power 3 GHz RF Signal Generator
- 3025 PXI 6 GHz RF Signal Generator
- 3025C PXI 6 GHz RF Signal Generator
- 3026C PXI High Power 6 GHz RF Signal Generator
- 3030A PXI 3 GHz RF Digitizer
- 3030C PXI 3 GHz Wideband RF Digitizer
- 3035 PXI 6 GHz RF Digitizer
- 3035C PXI 6 GHz Wideband RF Digitizer
- 3036 PXI 13 GHz RF Digitizer

## 3030 Series PXI RF Digitizers

The 3030 Series RF Digitizers can be used to provide wideband high dynamic range data acquisition of RF signals up to 13 GHz with up to 90 MHz instantaneous bandwidth. The 3030 Series offers high linearity, low noise and excellent level accuracy performance, ideal for the analysis of WLAN, WMAN and 2G/3G cellular radio signals.

| Parameter                       | 3030A   | 3035   | 3030C  | 3035C | 3036   |
|---------------------------------|---|--|--|-------|--------|
| Input Frequency Minimum         | 330 MHz   |  | 250 kHz  |       |        |
| Input Frequency Maximum         | 3 GHz   | 6 GHz  | 3 GHz  | 6 GHz | 13 GHz |
| Frequency Resolution            | 1 Hz to 3 GHz, 2 Hz to 6 GHz, 4 Hz to 9 GHz, 8 Hz to 12 GHz   |  |  |       |        |
| Frequency Settling Time         | <250 $\mu$ s  |  | <500 MHz 2 ms<br>>500 MHz 325 $\mu$ s  |       |        |
| Maximum Input Level             | +22 dBm<br>(8 dB RF atten)                                    | +30 dBm (10 dB RF atten)   |  |       |        |
| RF Input Attenuation            | 0 to 28 dB (step 4 dB)  | 0 to 31 dB (step 1 dB)   |  |       |        |
| Level Accuracy                  | <3 GHz, 0.6 dB, 0.3 dB typ<br>>3 GHz 1.0 dB                   |  | <500 MHz <1.0 dB, 0.5 dB typ<br><3 GHz 0.7 dB, 0.3 dB typ<br><6 GHz 1.0 dB<br>>6 GHz 2.0 dB                          |       |        |
| Return Loss                     | 16 dB   |  |  |       | 15 dB  |
| Sensitivity                     | -145 dBm/Hz typ<br>-152<br>3GHz-150 typ                       | -140 dBm/Hz typ  | Typ -148 dBm <500 MHz<br><-147 dBm/Hz typ 500 MHz<br><140 dBm/Hz, -149 dBm/Hz typ<br>>6 GHz                          |       |        |
| Residual Spurious               | -100 dBm typ  |  |  |       |        |
| Spurious Response               | -75 dBc   |  | -70 dBc  |       |        |
| LO Phase Noise (2 GHz)          | -116 dBc/Hz @ 20 kHz offset, -138 dBc/Hz @ 10 MHz offset      |  |  |       |        |
| Intermodulation                 | -75 dBc (2 tone at 0 dBm)                                     |  |  |       |        |
| Instantaneous Bandwidth (-1 dB) | 36 MHz  |  | <500 MHz 20 MHz<br><1 GHz 35 MHz<br>1 GHz 90 MHz   |       |        |
| Amplitude Flatness              | <0.1dB over 5 MHz<br><0.25 dB across 30 MHz                   | <0.1dB over 5 MHz<br><0.25 dB across 33 MHz (<2.9 GHz)<br><0.4 dB across 33 MHz (>2.9 GHz) | 0.1dB across 5 MHz<br>0.25 dB across 15 MHz <500 MHz<br>0.25 dB across 33 MHz <1 GHz<br>0.25 dB across 67 MHz >1 GHz |       |        |
| Maximum Sample Rate             | 85 MSa/s  |  | 250 MSa/s  |       |        |
| Sample Resolution               | 16 or 32 bit  |  |  |       |        |
| ADC Clock Rate                  | 103.76 MHz  |  | 250 MHz  |       |        |
| ADC Resolution                  | 14 bit  |  | 13 bit   |       |        |
| Sample Memory                   | 256 Mbyte   |  | 512 Mbyte  |       |        |
| Real Time Data Out              | LVDS up to 90 MSa/s,  |  |  |       |        |
| Triggering                      | TTL, Data I/O, Star Trigger, Trigger Bus, Local Bus, Software |  |  |       |        |
| Slots Occupied                  | 2   |  |  | 3     |        |
| Slot Type                       | PXI 1   |  | PXIe Hybrid slot compatible  |       |        |

## 3060 Series PXI RF Combiners

The versatile 3060 Series RF combiners avoid the need for extraneous RF signal conditioning development in the test fixture, thereby simplifying test system design and calibration. The modules are designed for use in RF test systems in conjunction with the 3020 Series digital RF signal generator and 3030 Series RF digitizers. Together these modules enable the development of compact, high performance low cost modular RF test systems.

## Aeroflex PXI Products

- 3060 PXI RF Combiner 2.7 GHz
- 3061 PXI RF Combiner with 3 way switched output 2.7 GHz
- 3065 PXI RF Combiner 6 GHz
- 3065A PXI RF Low Loss RF Combiner 6 GHz
- 3000/3000B Chassis
- 3001B/3001C PXI Controller Module
- GSM/EDGE Measurement Suite



## PXI Systems

Aeroflex PXI 3000 Series modules and software components can be configured as part of complete test systems. With the addition of Aeroflex custom application software development services and full system integration and support, complete turnkey test systems can be supplied. The table below illustrates how PXI 3000 Series modules and options may be used as essential building blocks in PXI system development.

| Application               | Module Type Required  |             |             |   | 3030 opt | 3020 opt | PXI slots (min) |
|---------------------------|---|-------------|-------------|---|----------|----------|-----------------|
|                           | 3010/3011   | 3020 Series | 3030 Series | 3060 Series   |          |          |                 |
| LTE (FDD)                 | One per 3020 or 3030 series module... Minimum of one 3011 recommended | * + ★       | ◆           | Recommended to provide full duplex antenna connection | 107      |          | 6               |
| LTE (TDD)                 |   |             |             |   | 108      |          |                 |
| UMTS/HSPA/HSPA+           |   |             |             |   | 101      |          |                 |
| GSM/EDGE                  |   |             |             |   | 100      |          |                 |
| TD-SCDMA                  |   |             |             |   | 109      |          |                 |
| cdma2000 & 1x EV-DO       |   |             |             |   | 102      |          |                 |
| WiMAX M2300T-01-M2500T-01 |   |             |             |   | 104      |          |                 |
| WLAN IEEE 802.11b/g       |   |             |             |   | 103      | 100      |                 |
| Bluetooth®                |   |             |             |   | 106      | 100      |                 |
| ZigBee®                   |   |             |             |   | 111      | 100      |                 |
| WiMAX M3300T-01-M3500T-05 | One per 3020 or 3030 series module... Minimum of one 3011 recommended | + ★         | ◆           | Recommended to provide full duplex antenna connection | 104      |          | 7               |
| WLAN IEEE 802.11a/n       |   |             |             |   | 103      | 100      |                 |
| WLAN IEEE 802.11ac        |   |             |             |   | 113      | 100      |                 |

## Key

### RF Synthesizer Modules

3010 or 3011  
(one per VSA/VSG module)

### VSG Modules

3020A, 3020C<sup>1</sup> or 3021C<sup>2</sup>  
3025  
3025C<sup>1</sup> or 3026C<sup>2</sup>

### RF Combiner Modules

3060 or 3061  
3065 or 3065A<sup>2</sup>

### Notes

<sup>1</sup> Preferred

<sup>2</sup> additional PXI slot required

### VSA Modules

3030A or 3030C<sup>1</sup>  
3035  
3035C<sup>1,2</sup> or 3036<sup>2</sup>

- UMTS/HSPA Uplink Measurement Suite
- LTE FDD Measurement Suite
- LTE FDD and TDD Measurement Suites
- CDMA2000/1xEV-DO Reverse Link Measurement Suite
- TD-SCDMA Measurement Suite
- WLAN Measurement Suite
- WiMAX OFDMA Measurement Suite
- Bluetooth® Measurement Suite
- Generic Measurement Suite

# Audio and Video Quality

## Audio and Video Quality

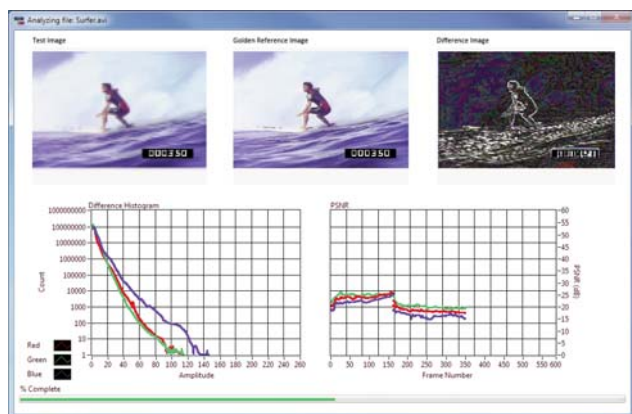
### Quality Assessment Challenges of the Audio and Video Industry

There are many quality assessment challenges in the audio and video industry such as assuring a positive consumer experience, reducing product verification times, test repeatability, and production volume scaling. Subjective human viewing of video is the common answer to these challenges, but there are costly drawbacks to this approach. Viewing panels must be qualified and measurement consistency is complicated by manual test setups and human fatigue variability.

### The Objective Audio/Video Test Solution

The Aeroflex 9200 Audio/Video Test Set is an innovative device for objective metric analysis of audio and video quality. The 9200 detects quality artifacts such as video pixelation and macroblocking as well as audio drop-outs and harmonic distortions. Test cases can be quickly configured and provide repeatability for performance validation. All audio and video measurements can be recorded and analyzed using the 9200's included test and automation software.

The 9200 instrument can be applied to numerous consumer electronic assessments including: set-top boxes, mobile media devices, smartphones, video disc players, video gaming systems, and more!



*The 9200 includes test and automation software for distortion analysis*



*Aeroflex 9200 Audio/Video Test Set*

Improve product quality through objective and consistent audio/video test metrics that reduce test times, subjective human errors, and operational monitoring costs throughout the entire product life-cycle.

### Complete Product Life-Cycle Quality Testing

Adding value from product design phase to warranty services, the 9200 provides time-saving insight into audio and video quality.

R&D: Gain competitive advantage by consistently identifying best in class designs and verifying new product performance quality while minimizing costly development rework.

Production: Improve manufacturing throughput by minimizing test times and cost with consistent product validation that reduces subjective human error through automated quality measurements.

Sustainment: Consistent root cause triage of returned products that eliminates costly penalties of attempted repair on no-fault-found devices.

The 9200 instrument can also add value to service providers by helping assess quality-of-service and quality-of-experience.

### Aeroflex 9200 Key Product Features

- Objective detection of audio and video quality distortions such as frame jitter, frozen frames, or blank screens
- Video fidelity assessment using metrics such as Peak Signal Noise Ratio (PSNR) and Structural Similarity (SSIM) index
- Soundtrack and tonal harmonic audio analysis
- Provides reference-based (golden) quality analysis and golden video creator application
- Includes API for client control and automation plus storage and playback of recorded video
- Includes interfaces ranging from analog to digital



# ATE

## Automatic Test Equipment

### 5800 Series - Multi-Strategy Test System

The 5800 Series is an affordable common core, multi-functional test system, combining Aeroflex mixed signal, analog functional, digital functional and analog in-circuit cards with the added benefit of using any 3U PXI instrument.

- Highly configurable test platform, allowing in-circuit PCB level test to full end-of-line unit test
- Wide choice of tester interface
- Scalable with up to 3,456 test pins
- Open architecture
- .NET compliant software

Available in various body styles:



*Benchtop, 19" Rack Mounted and Floor Standing*

- In-system programming
- Boundary scan
- Vectorless test

### 4200 Series – In-Circuit Test System

The 4200 Series is an advanced manufacturing test system that provides a wide range capability for all your in-circuit test requirements.

- Maximum of 2,048 universal test pins
- Multiplexed or non-multiplexed test pin cards
- Boundary scan
- Single box solution

Available in two models:



*4230 - 19" Rack Mounted, 4250 - Floor Standing*

Aeroflex Card Suite Functionality

- Analog and digital in-circuit
- Analog functional

### Aeroflex Manufacturing Test Products

- 5800 Series - Multi-Strategy Test Systems
- 4200 Series - In-Circuit Test Systems
- 5200 Series - Analog In-Circuit Test System



### 5200 Series – Analog In-Circuit Test System

The 5200 Series is a cost effective test system that provides high speed, high accuracy analog in-circuit testing.

- ICT accuracy at MDA speed
- Up to 2,112 test pins
- Up to 1,200 tests per second
- Optional dual-vacuum control

Available in the following model:



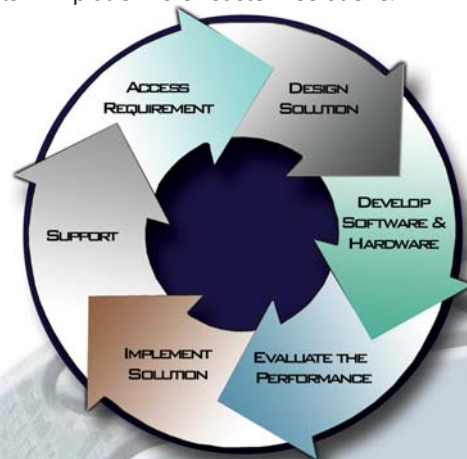
*5220 - Benchtop System*

Aeroflex card suite functionality

- Analog in-circuit

### Applications – In-Circuit, Functional and Custom

Aeroflex has considerable experience in building a large number of test systems covering a wide market sector including full system design, test definition, build to print, from DC to microwave. In addition, Aeroflex can provide anything from module development to full turnkey solutions for all of its ATE platforms of custom solutions.



- i-Base® Test Area Management Software
- Applications – In-Circuit, Functional and Custom
- Service and Support

# Semiconductor

## AX-Series Semiconductor Test Systems

Expanding the ATE Ecosystem

### True Flexibility

Modular industry standard PXI and AXIe technology gives users control over their test system configurations and upgrade paths. The PXI and AXIe platforms provide a mature, stable foundation that will support the wide range of configurations and long term roadmaps required by the semiconductor industry.

### Unprecedented Cost-of-Test

The PXI and AXIe standards enable low cost, high performance systems and instruments. Aeroflex has taken the lead in bringing these 2 standards together in highly cost effective semiconductor characterization and production test systems and with unprecedented price/performance scalability.

### Rich Roadmap

The power of AXIe and PXI-based test systems resides in the multitude of instrument offerings and optimized software tools available from a broad range of suppliers. The AX-Series of products available from Aeroflex include:

- Test Systems
- AXIe Test Instruments
  - 48 channel 400 MB digital pin card with per-pin architecture
  - 12 channel 20V/1.2A device power supply card
  - AXIe system controller
  - AXIe starter board
- PXI Test Instruments and Subsystems
  - PXI 3000 Series RF modules
  - Dual 6 GHz RF VNA port modules
  - RF multiplexer and splitter modules
  - Integrated AX-RF subsystem with comprehensive auto cal
- Add-ons and upgrades to existing test equipment
- AX-Series Test Software Environment

### Markets Served

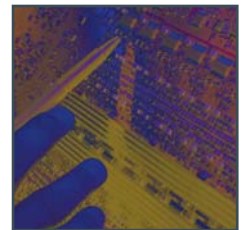
The AX-Series integrated semiconductor test instruments and systems from Aeroflex are ideally suited for characterization and production test of:

Consumer RF Semiconductors including:

- Discretes
- Power amplifiers
- Front end modules
- Tuners
- RFID/NFC
- ZigBee®
- Bluetooth®
- WLAN
- Transceivers

Consumer mixed signal semiconductors including:

- Wired communications
- Audi/Video
- Interface
- Modems
- Microcontrollers
- MEMs



### Aeroflex Semiconductor Products

- AX500 AXIe Benchtop System
- AX520 AXIe/PXI Benchtop / Production System
- AX1020/AX1040 Mid Range Benchtop / Production System
- AX2820 High Pin Count Production System
- AXRF integrated subsystem

## Product Overview

| System           | Form Factor  | AXIe Slots | PXI Slots | Example Configuration   |
|------------------|--|------------|-----------|---|
| AXRF             | Benchtop or Rack Mount                                 | 0          | 20        | 8 Port RF Subsystem   |
| AX500            | Benchtop or Rack Mount                                 | 5          | 0         | 144 Digital Pins<br>12 Device Power Supplies  |
| AX520            | Benchtop, Engineering Stand, or Production Manipulator | 5          | 20        | 144 Digital Pins<br>12 Device Power Supplies<br>8-Port RF Subsystem<br>AWG, Digitizer, TMU  |
| AX1020<br>AX1040 | Benchtop, Engineering Stand, or Production Manipulator | 10         | 20/40     | 288 Digital Pins<br>24 Device Power Supplies<br>8-Port RF Subsystem<br>AWG, Digitizer, TMU  |
| AX2820           | Engineering Stand or Production Manipulator            | 28         | 20        | 1056 Digital Pins<br>48 Device Power Supplies<br>8-Port RF Subsystem<br>AWG, Digitizer, TMU |



AX500 – AXIe Benchtop System



AX520 – AXIe/PXI Benchtop/Production System



AXRF Subsystem

## System Architectural Details

- AXIe and PXI standard card formats
- Air cooled test heads
- RF and analog instruments
- Coherency between AXIe and PXI Chassis
  - PXI configured
  - COAX connection to DUT site
- Digital and DC instruments
  - AXIe configured
  - PXI Express switched fabric
  - 10 MHz and 100 MHz clocks
  - Star triggering
  - Analog and calibration bus
  - Rear panel DUT connections

## Software

- S/W operating system
  - Characterization environment based on TestStand™
  - Support for Visual Studio® C++ interface, CVI and LabVIEW™
- Multi-site support
- Production maintenance tools
- Calibration and checkers
- Third party software is natively supported

# General Purpose Test Microwave

Our comprehensive spectrum analyzer and microwave analyzer products help round out the Aeroflex test and measurement product portfolio. The requirements to cover wide frequency range and bandwidth are key drivers and attributes of the Aeroflex general purpose test product line.

The general purpose test equipment available from Aeroflex covers a broad range of markets including component/sub-assembly testing in R&D and manufacture through to testing complete products or systems. Test capabilities are available for maintaining, installing and commissioning mobile handsets, base stations, microwave links, satellite ground stations and radar installations.

## Microwave Analyzers, Power Meters and Counters

Deployed worldwide for microwave test and measurement, Aeroflex microwave test instruments have a frequency range from 1 MHz to 46 GHz (up to 110 GHz with microwave frequency extenders). Options include tracking/offset/CW/modulated source, scalar and spectrum analyzers, fault location and group delay - for characterization of components and assemblies.

With a frequency range from 30 kHz to 46 GHz and power levels from -70 dBm to +44 dBm (25 W), Aeroflex power meters are designed for both ease of use in the field and on the bench.

This product range also includes the CPM (Counter Power Meter), a ruggedized solution for microwave frequency and power measurements in the field.



## Aeroflex Microwave Products

- 6810A Series Microwave Generators
- 6820A Series Microwave Scalar Analyzers
- 6840A Series Microwave System Analyzers

## 6820A Series Microwave Scalar Analyzer

- Integrated source and scalar analyzer
- 3 GHz, 8.4 GHz, 20 GHz, 24 GHz, 40 GHz and 46 GHz frequency versions
- Synthesized source with low harmonic content
- Precision scalar network measurements
- Real time fault location with 0.1% accuracy

The 6820A is a versatile scalar analyzer and integrated synthesized frequency source enabling easy, fast, accurate testing of transmission lines, microwave components, sub-assemblies and complete microwave systems.

The scalar analyzers provide a very effective test methodology for device/system measurements without the usual complexities, calibrations and costs associated with VNAs. Typical measurements include insertion loss, VSWR/return loss, conversion loss/gain, amplifier gain compression and distance to fault.

## 6840A Series Microwave System Analyzer



- Integrated source, scalar and spectrum analyzer
- Precision scalar network measurements with high dynamic range plus tuned/selective measurements
- Comprehensive group delay measurement capability without the need for external devices and complex calibrations even when characterizing frequency translation devices

The 6840A Series RF and microwave system analyzers are powerful tools for the microwave industry. Integrated into a single instrument are a synthesized source, a three input scalar analyzer and a synthesized spectrum analyzer. The internal source can be used as a simple CW output, as a swept source for scalar measurements, as a tracking generator with the spectrum analyzer and as an offset tracking source for network measurements on frequency translation devices.

- 2186 and 2187 Step Attenuators



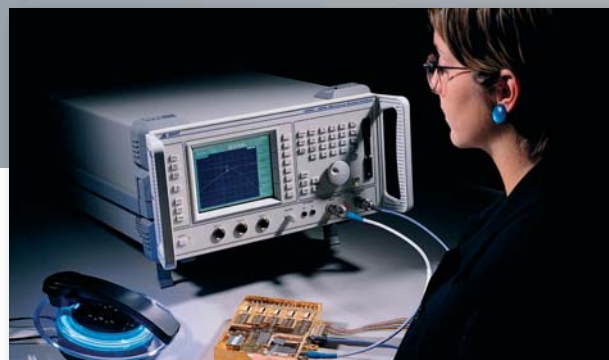
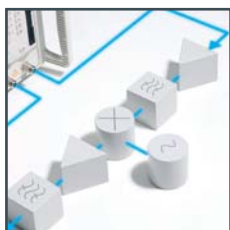
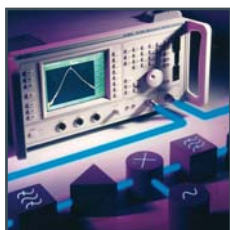
# Counters & Power Meters

## CPM 20 and 46 Counter Power Meters



- Combined frequency counter and power meter
- 10 MHz to 20 GHz and 10 MHz to 46 GHz versions available
- Large, easy to read screen allows simultaneous display of both power and frequency measurements
- Built-in DVM for AGC voltage measurements

Aeroflex's Counter Power Meter (CPM) is a portable combination of three instruments: a microwave frequency counter, true power meter and digital voltmeter. A compact instrument with internal rechargeable battery, ruggedized case and carrying strap, it can be used up a tower, on a roof top or at a field site. Digital microwave radios are commonly installed for network access to mobile radio cell sites and quick installation of business communications. The CPM is the ideal instrument for installation and maintenance engineers working on these systems.



## 6970 RF Power Meter



- Hand-held for portability
- Battery powered for field use
- Wide frequency range: 30 kHz to 46 GHz
- Built-in power reference
- Excellent accuracy traceable to national standards

The 6970 RF Power Meter provides precision microwave power measurements in a hand portable battery-powered package. A wide range of user features, including duty cycle, relative power measurements and limit checking make the 6970 highly versatile. The same wide range of power sensors used with the CPM Counter/Power Meter are also used by the 6970.

## Aeroflex Counters Power Meter Products

- CPM 20/46 Counter Power Meters
- 6970 RF Power Meters
- 6910/6920/6930 Series RF Power Sensors

# Broadband

## Broadband Test

The need for accurate broadband test and measurement solutions becomes critical as wideband technologies become more pervasive. With expertise in signal environment generation, wideband signal recording and analysis, Aeroflex offers the highest speed and performance in the broadband communications testing environment. Aeroflex systems are the instrument of choice in radio, radar, UWB systems, EW, and satellite test.

Aeroflex broadband instruments can support product evolution all the way from system definition through release verification, prototyping, field testing, and to final production testing. Options include RF bandwidths up to 400 MHz, frequency ranges to 18 GHz, and streaming memory capabilities up to multiple terabytes for both record and playback.

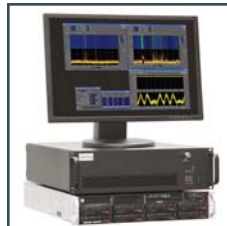
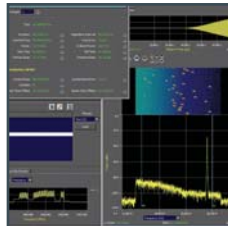
The Vector Signal Simulator (VSS), a software application, sets Aeroflex apart from all other competitors. Integrated into the Broadband Signal Generator line, VSS allows users to specify and mix multiple signals—thereby simulating a realistic, multi-carrier, multi-format RF environment that is extraordinarily thorough and highly accurate.

The **Broadband Signal Analyzer (BSA)** combines a broadband RF down-converter, a wide bandwidth high dynamic range ADC converter, deep high speed memory, and powerful DSP-based signal analysis software.

- Instantaneous RF bandwidths of 70 and 400 MHz
- Tunable RF configurations to 6 GHz and to 18 GHz
- Custom analysis of military radio, radar, and EW signals
- Long term capture and analysis of full bandwidth data
- Coherent analysis of time, frequency, channel power, and modulation parameters
- Demodulation of analog and digital signals
- Full parametric analysis of hopped and pulsed signals

The **Broadband Signal Generator (BSG)** combines a deep memory, high speed arbitrary waveform generator and a broadband RF up-converter with the powerful VSS signal creation and generation software.

- Instantaneous RF bandwidths of 70 and 400 MHz
- Tunable RF configurations to 18 GHz
- Long term playback of full bandwidth data
- Control of all time, frequency, channel power, and modulation parameters
- Generation of broadband analog and digital signals in their full signal environment.
- Ability to mix or superimpose an unlimited number of signals into a single output



### Aeroflex Broadband Products

- Broadband Signal Input Channels, BSA
- Broadband Signal Output Channels, BSG
- Signals Analysis Software Modules
- Signal Creation and Generation, VSS

# Systems

## Synthetic Test Environments

### SMART^E™ 5100 T/R Module Test Environment

The SMART^E 5100 T/R Module Test Environment is a member of the SMART^E 5000 Series, which is a complete test solutions environment from Aeroflex. The Model 5100 encompasses hardware, software, test practices and support along with standard and customizable test programs tailored to the specific problems of testing high performance modules utilized in a variety of phased array radars. The unique combination of integrated tests, system calibration methods and greater throughput in the 5100 provides a superior solution for the testing of the thousands of modules required for phased array radar.

- **Complete Synthetic Test Environment**
  - Hardware, software, processes, support
  - Open architecture, system level calibration and diagnostic
- **Optimized for T/R Module Test**
  - Test module subassemblies, modules and multi-module assemblies on one system
  - DC-40 GHz, DUT control and monitoring
- **Full Range of Required Mixed Signal Capabilities**
- **Highest Test Throughput and Lowest Life Cycle Cost Available**
- **Proven Systems Deployment**
  - 5th generation solution – major customers worldwide

### SMART^E™ 5200 Satellite Payload Test Environment

The Model 5200 encompasses hardware, software, test practices and support along with standard and customizable test programs tailored to the specific problems of testing high performance payloads. Such payloads consist of many channels with possibly hundreds of connections between the test system and the payload under test.

The Aeroflex SMART^E 5200 Test Environment is based upon the 5th generation evolution of Aeroflex's synthetic test technology.

- **Complete Synthetic Test Environment**
  - Hardware, software, processes, support
- **Optimized for Satellite Payload Test**
- **Highest Test Throughput and Lowest Life Cycle Cost Available**
- **Proven Systems Deployment**
  - 5th generation solution – major customers worldwide

### SMART^E Synthetic Multi-function Adaptable Reconfigurable Test Environments

- SMART^E 5100 T/R and RF/Microwave Test Environment
- SMART^E 5200 Satellite Panel, Payload, TVAC and Compact Antenna Range Test Environment



- **Full Range of Required Mixed Signal Capabilities**
  - DC, digital, analog, RF/microwave
- **System Level Architecture**
  - Calibration, verification, alignment, diagnostic
- **Open System Architecture**
  - System hardware and software, TPS's

### SMART^E™ 5300 General RF/Microwave Test Environment

The SMART^E 5300 is a complete test environment for testing RF-Microwave components, modules, assemblies, and subsystems.

It provides the stimulus and measurement resources required to perform a complete set of tests traditionally performed with discrete RF instruments but with greater speed, measurement quality and half the physical size of traditional instrumentation.

- The SMART^E 5300 provides emulation of many special purpose microwave instruments:
  - RF Signal Generator
  - Spectrum Analyzer
  - Power Meter
  - Noise Figure Meter
  - Vector Signal Analyzer
  - Phase Noise Analyzer
  - RF Frequency Counter
  - Microwave Transition Analyzer
  - and more ....
- IVI drivers which present an instrument interface to the user to facilitate legacy TPS compatibility
- Software programmability of the system provides customization to match performance of legacy systems and instruments such as the Microwave Transition Analyzer (MTA) to ensure legacy TPS compatibility
- The SMART^E's cutting edge performance is a result of using software configurable modules which utilize the best industry standard hardware and software

- SMART^E 5300 General RF/Microwave and Instrument Emulation Test Environment
- SMART^E 5150 Radar/EW Simulation and Test Environment

# Military Test

## Military Communications

### 3515 Series Radio Communications Test Set



The Aeroflex 3515 Series offers the latest in radio front-line testing, long battery life and superior performance. The Aeroflex 3515 Series has many of the features of a bench radio test set, plus it has a coaxial cable and antenna analyzer. The 3515 Series is perfect for testing AM, FM and digital radio transceivers.

Designed for portable operation, the 3515 Series is also ideal for performing vehicular radio installation testing. By utilizing over-the-air testing techniques, a radio installed in a vehicle can be tested, without making a direct connection to the aircraft or vehicle.

The 3515 Series has optional test application program capability that allows complete tests to be included. Here is a list of just some of the application programs:

- Radio tests for aircraft, boat, vehicle or portable radios
- Test intercom systems
- Provide detailed operating instructions for the unit under test
- Store test results and settings for later retrieval
- Add connection diagrams, parts lists and special setups



### 7200 Configurable Automated Test Set

- Software defined test set that replaces an entire suite of traditional instruments
- Advanced automation and test speed optimization
- State-of-the-art user touch-screen interface



The Aeroflex 7200 Configurable Automated Test Set platform provides the manufacturers and users of software defined radio (SDR), avionics, radar and other advanced devices with the most state-of-the-art synthetic instrument platform available today, while providing upgrade support for next generation devices in the future.

The 7200 provides the required functions and performance of a spectrum analyzer, signal generator, measuring receiver, power meter, BER meter, audio generator, audio analyzer, oscilloscope, DMM and more in a small ruggedized MIL-28800 Class 3 package. It operates in manual and fully automated modes with a built-in test executive. An optional switch matrix interface and the ability to directly control the device under test provides very high speed automated test capabilities.

The Aeroflex 7200 provides a test solution that significantly lowers your acquisition and total life cycle support costs, and with its modular architecture can be tailored to your specific requirements.

### Radio Communications Test Systems (RCTS)

The Military Radio Communications Test System (RCTS) is used by the U.S. Armed Forces to test complex voice and data frequency hopping radios and accessories.

The ruggedized packaging of 16 basic generator/receiver instruments makes the system ideal for depot and field maintenance shops. When combined with one of the "Plug and Play" Radio Personality Modules (RPM) and the appropriate cables, the test system provides semi-automated testing of various military radio systems (UHF, VHF, HF) and accessories. Very little operator intervention or training is required to perform radio testing and repair.

### Aeroflex Military Communications Products

- 3515 Series Portable Radio Communications Test Set
- 7200 Configurable Automated Test Set
- RCTS-001 Radio Communications Test System
- GRM-122 Avionics Upgrade Systems



## RCTS-001 Radio Test System



- Ground and airborne radios
- Loud speaker
- RF PA
- Remote controls
- Single radio mount

The RCTS-001 (AN/GRM-122) is the radio test system currently fielded for depot and field maintenance of SINCGARS military radio equipment. When used in conjunction with an ON-373 B and ON-AVIM maintenance kit, the user has everything needed to perform testing, repair and maintenance on the entire suite of SINCGARS equipment.

## GRM-122 Avionics Upgrade Systems

These systems upgrade existing GRM-122 systems fielded by the U.S. Army to test Army airborne radios and navigation systems. The following upgrade kits are available:

|                |   |
|----------------|---|
| GRM-122 Av kit | Complete avionics, life support and HAVEQUICK upgrade |
| RPM-12CK kit   | Avionics upgrade                                      |
| RPM-2HCK kit   | HAVEQUICK upgrade                                     |

## RCTS-002HQ Radio Test System

- Ground radios
- Airborne radios
- Hand-held radios
- Remote controls
- RF amplifiers
- Single distribution unit

The RCTS-002HQ Radio Communications Test System is a self-contained unit used to test U.S. Air Force ARC-222 and ARC-186 radios. The addition of HAVEQUICK capability enables the testing of ARC-164 radios.



## RCTS-003B Radio Test System



The following LRUs can be verified, tested and repaired with the RCTS-003B:

|          |             |                             |           |
|----------|-------------|-----------------------------|-----------|
| PRC-90   | PRC-90T     | PRC-90-2                    | PRC-90-2T |
| PRC-112  | PRC-112A    | PRC-112B                    | PRC-112B1 |
| PRC-112C | PRC-112D    | PRC-112G                    | URT-33C/M |
| URT-33D  | Quickdraw 2 | (w/ COSPAS/SARSAT & SATCOM) |           |

The RCTS-003B Radio Communications Test System is the current generation self-contained, transportable, semi-automated radio test system that is presently fielded for use by the U.S. Armed Forces. The instrument is used for operational verification testing and/or repairs of life support radio systems. Full functional testing of all operational modes is available.

## RCTS-012 Radio Communications Test Set



The RCTS-012 Radio Communications Test Set is used to test the AN/ARN-89, AN/ARN-123, AN/ARN-147 and AN/ARN-149 avionics/navigation radios.

The unit provides a semi-automated, comprehensive test and alignment capability for the above systems, reducing test time and operator training.

## Aeroflex Military Communications Products

- RCTS-002HQ Radio Communications Test System
- RCTS-003B and Accessories Radio Communications Test System
- RCTS-004 and Accessories Radio Communications Test System

- RCTS-007 and Accessories Radio Communications Test System
- RCTS-012 Radio Communications Test Set

# Service and Support

## Service and Support

Aeroflex Test Solutions Service and Support is committed to providing world class service and support through a portfolio of comprehensive products all designed to meet or exceed your expectations.

Our goal is to provide seamless global support to our diverse customer base in a manner that reduces the cost of ownership while increasing customer satisfaction.

### Global Support

At Aeroflex, we understand that downtime can be expensive and, keeping your instruments operational and at peak performance is critical to your business. The quality of our support directly affects your business' profitability, employee productivity and your satisfaction. Along with our state-of-the-art test instruments, Aeroflex has developed a comprehensive range of extended warranty contracts and service contracts to ensure that you can maximize the uptime of your investment and give you the peace of mind that comes with the knowledge that your test instrument will be fully maintained during its lifecycle. When you purchase a test instrument from Aeroflex, you make an investment backed by one of the most comprehensive service and support organizations in the industry. Aeroflex's experience with a diverse customer base has shown us that our customers' support requirements vary considerably. With our flexible approach to customer support, starting from the date of purchase through the life of the instrument, we have a support program that fits your needs.

### End-to-End Coverage

When your test instrument is enrolled in an Aeroflex Service and Support Contract, any unplanned, high cost maintenance events are eliminated. Service and Support Contracts offer you both convenience and reduced administrative burden by transferring the workload and responsibility to Aeroflex or sharing the workload if you select our Partner Support Option. Many of our customers have a fully trained and competent maintenance team that can provide first line support and effectively reduce the downtime. Utilizing your own Aeroflex trained maintenance group, the Partner Support Service Contract enables you to troubleshoot and maintain an Aeroflex instrument via in-house expertise while still being protected in the knowledge that Aeroflex engineers are just a phone call away should additional support prove necessary.

An Aeroflex Service and Support Contract offers additional support beyond the Aeroflex standard warranty period. It delivers increased customer satisfaction and lower lifetime costs of ownership through a combination of business and operational benefits that help your business increase performance.

For more details on customer specific service and support options go to [aeroflex.com](http://aeroflex.com) or contact your Aeroflex regional service and support center.



### Aeroflex Service and Support Locations

- Americas
- Europe
- APAC

## Technical Support

Our technical support department delivers responsive and rapid problem isolation through our call management system. Aeroflex helpdesk personnel will route your support request, by telephone or internet, to the right person and manage that request for assistance through to completion.

In partnership with the customer, Aeroflex will determine both the best and quickest course of action to resolve your technical support request.

### Americas

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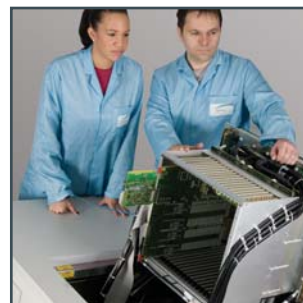
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# AMS Aeroflex Microelectronic Solutions

Aeroflex Microelectronic Solutions is a world leader in the design, manufacturing and marketing of high-reliability integrated circuits and packaging, motion control and motors, microwave and RF devices, components and subsystems for the aerospace, defense, fixed broadband, wireless/mobile, and test and measurement markets.

Aeroflex's Colorado Springs, Gaisler, Metelics, Motion Control, Plainview and RAD divisions provide HiRel standard and custom integrated circuits and circuit card assembly for the aerospace, high-altitude avionics, medical, x-ray cargo scanners, critical transportation systems, nuclear power controls, GPS receivers, networking and telecommunication markets.

Aeroflex's RF and Microwave (RFMW) division and its business units are firmly established as the industry's most complete suppliers of RF, microwave and millimeter wave devices, components and subsystems. Our broad offering of standard products, innovative, custom-engineered designs and comprehensive resources enable Aeroflex to support the most demanding high-performance product needs of our worldwide customers.

The RFWW business units include:

- Aeroflex Control Components
- Aeroflex / Inmet
- Aeroflex / Metelics
- Aeroflex Plainview
- Aeroflex Nanjing
- Aeroflex / Weinschel

As an industry leading supplier of microwave and RF products, Aeroflex's advanced technologies, broad capabilities, engineering expertise, manufacturing facilities and experience marketing products into a wide range of industry applications are aligned to serve our customers' requirements for cost-effective products that are delivered on time.

Included in our broad product range, Aeroflex offers a comprehensive array of coaxial components ideally suited for test and measurement applications. These T&M accessories are available from Aeroflex/Inmet and Aeroflex/Weinschel and include coaxial components operating over frequency ranges up to 65 GHz and to power levels of 1 kW CW.

Our core T&M component offering includes:

- Coaxial fixed and step attenuators
- Precision terminations
- DC blocks and bias tees
- Resistive splitters and dividers
- In and between series adapters
- Planar Blind-Mate® connectors
- Planar Crown® connectors
- SmartStep® test interconnect and signal conditioning subsystems
- Equalizers
- Detectors and limiters
- Switches

Please visit our web site at [www.aeroflex.com/AMS](http://www.aeroflex.com/AMS) for additional information.





Aeroflex.com delivers the latest information about our products, services, news and events.

## **Performance-Driven Content**

We understand you need a web site that allows you to access information quickly and easily. That's why we provide an Aeroflex Test Solutions home page with easy navigation options, menu structure and product directory. Aeroflex.com also offers a search box in the top menu bar.

## **Solution-Minded Design**

Our web site is organized around making it simple to find the right test solution. With an easy product directory to follow, we'll lead you to the right product. Once you're on a product page, we give you the key stats, right up front- along with all the related information you need- data sheets, application notes, software, articles, news and more. You can even request a quote right there. Easy.

## **Customer-Focused Service**

We want to exceed your expectations. That's why we have recently updated our Customer Service/Support area of the web. RMAs, hardware and software support, training information and sales office locations are all available online, ready at your convenience.

You can also find information about our worldwide service centers through our web site- 24/7 at [Aeroflex.com/support](http://Aeroflex.com/support).

## **News You Want. Events You'll Want to Attend.**

Sign up online for our e-mail newsletter, and, each month, you'll receive all the latest Aeroflex news, including upcoming product announcements, new application notes and product software releases. You can also find the information you need about key industry trade shows. Of course, our latest products are always available on the Aeroflex Test Solutions home page.

# Aeroflex

## Why choose Aeroflex?

Aeroflex is a global organization with employees located throughout North America, Europe and Asia/Pacific Regions. Aeroflex has a global customer base which is underpinned through our global sales and service and support teams.

### Locations

#### USA

Austin, TX  
Cupertino, CA  
Kansas City, KS  
Plainview, NY  
Wichita, KS

#### Europe

England  
Denmark  
Finland  
France  
Germany  
Scotland

#### Asia-Pacific

China  
India  
Japan  
Korea  
Singapore  
Taiwan





Aeroflex can spec products to meet your design requirements. We seek to work with you through every aspect of your design processes as you develop new technology platforms, delivering precisely engineered products to your specifications.

**Aeroflex has:**

**Global Team Approach to Your Needs**

Coordinated Efforts Across the Globe to  
Manage Customer Accounts

**Global Network of Manufacture  
Representatives and Distributors**

Covering Customer Needs Globally with a  
Wide Reach

**Aeroflex Customer Support**

Global Support  
End-to-End Systems Support  
Technical Support

**Aeroflex Strengths**

- We focus on performance, design and manufacturing innovation
- We focus on strengthening our long-term customer relationships
- We invest in R&D and new product development to keep our solutions up-to-date with the latest high technologies
- We use a team-based sales approach which enables close technical collaboration with our customers
- No matter where you are Aeroflex provides worldwide support for sales and service
- We are ISO 9000 registered

Our use of experienced engineering personnel as part of the sales effort enables close technical collaboration with you during the design and qualification phase of new technologies and equipment. We believe that this is critical to the integration of the product into your equipment.

# Contact Us

|                       |   |
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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.