ON YOUR WAVELENGTH

+ COMPONENTS
+ TEST EQUIPMENT
+ DESIGN & MANUFACTURE
+ SERVICE & CALIBRATION

THE ASPEN ADVANTAGE
ANALOGUE, DIGITAL, RF, MICROWAVE & MILLIMETRIC COMPONENTS & SUB-SYSTEMS

COMPONENT PRODUCT PRINCIPALS

E-MAIL: SALES@ASPEN-ELECTRONICS.COM

Adsan
c
- Very High Speed Mixed Signal ICs to 50GHz/50Gbps.
- Multipliers & Demultiplexers.
- Phase Shifters & Variable Delay Lines.
- Selectors & Switches, Analogue to Digital Converters.
- Linear, Limiting & Transimpedance Amplifiers (TIAs).
- Track & Hold Amplifiers.
- High Speed Logic, Clock Processors & Signal Generators.
- PRBS Pulse Generators from 4 to 40Gbps.

Anaren
c
- RF Components for Wireless Infrastructure & Consumer Electronics from DC to 8GHz.
- LTE, GSM, CDMA, DCS, PCS, UMTS, WiMAX, WiFi, SATV & RFID.
- Surface Mount Baluns & RF Cross Overs.
- High Power Resistors, Terminations & Attenuators.
- Xinger Surface Mount Power Dividers & Doherty Combiners.
- Xinger Surface Mount Hybrid & Directional Couplers.

Anaren
c
- RF & Microwave Passive Components to 18GHz.
- Continuously Variable Attenuators.
- Fixed & PIN Diode Attenuators.
- Phase Shifters & Line Stretchers.
- Directional & Hybrid Couplers.
- Power Dividers & Combiners.
- Terminations, DC Blocks, Switches & RF Shorts.

Arizona Capacitors
c
- Wound Film Capacitors for Industrial, Commercial & Defence Applications.
- Paper/Foil, Polyurethane/Foil or Paper/Polyester.
- Metallised Polyester & Metallised Polyurethane Wrap & Fill.
- High Voltage Plastic Film, Paper/Polyester & Metallised Polyester.
- Electronic Filters including EMI, Low Pass, Feed-Through-Capacitors, Power Line & Audio Frequency Filters.
- An Electro Technik Industries Company.

Arca
c
- High Frequency SMA to 27GHz, SMP, 3.5mm & 2.92mm.
- QDS, QMA, Miniature SMB, SMC, MCX & MMCX.
- TW34, TWBNC Twin-Axial, TRB Tri-Axial & Push-Fit.
- BNC, TNC, N-Type, SMA, HN, SC, LT, C-Type & UHF.
- RF Coaxial Connectors & Adaptors.

Bird Technologies
c
- Terminations & Loads from 2W to 80kW including Convection & Conduction Cooled Models to 18GHz.
- Attenuators from 2W to 4kW.
- Splitters, Couplers & Signal Samplers.
- Coaxial Adaptors including EIA Rigid-Line Adaptors.

CrossPoint Technologies
c
- RF & Microwave Switching Systems for Commercial & Defence Applications including Satellite Earth Stations, Signal Exploitation, ELINT COMINT, SIGINT, TT&C & Test.
- Standard Products for HF, VHF, UHF & Microwave Systems to 18GHz.
- Matrix Switching Systems.
- Redundancy Switching Systems.
- Routing/Selector Switches.
- Solid State & Electromechanical Versions.
- Custom Designs Available.

Croven Crystals
c
- Precision Quartz Crystal Resonators.
- AT, FC, IT & SC-Cut crystals from 1 to 360MHz.
- Low Phase Noise & Low Ageing.
- Cold Weld & Resistance Weld Holders.
- QPL Approved Since 1967 per MIL-PRF-3098B.
- Rapid Prototyping Capability.
- Extensive Inventory of Samples.

Custom MMIC
c
- RF to Millimeter Wave InP pHEMT, GaAs pHEMT, InGaP HBT, GaN pHEMT & GaAs MESFET MMICs.
- Distributed Amplifiers, LNAs, PAs & Drivers to 50GHz.
- Phase Shifters, Attenuators & Switches to 50GHz.
- Mixers: Fundamental, Dual & I/Q to 32GHz.
- Multipliers: Active & Passive to 40GHz.

Custom Suppression
c
- EMI & RFI Filters for Industrial, Commercial & Defence Applications.
- Solder-in Filters, Resin Sealed Filters & Capacitors.
- Hermetically Sealed Filters & Capacitors.
- Custom Filtered Connectors & D-Connectors.
- Custom Multi-Section EMI/RFI Filter Assemblies.
- Power Line Filters & Commercial Filter Assemblies.
- An Electro Technik Industries Company.

Delta Electronics Manufacturing
c
- RF Coaxial Connectors & Adaptors.
- BNC, TNC, N-Type, SMA, MN, SC, LT, C-Type & UHF.
- TW34, TWBNC Twin-Axial, TRB Tri-Axial & Push-Fit.
- QDS, QMA, Miniature SMB, SMC, MCX & MMCX.
- High Frequency SMA to 27GHz, SMP, 3.5mm & 2.92mm.

Diamond Antenna & Microwave
c
- Coaxial & Waveguide rotary Joints for Commercial, SatCom, ATC, Defence & Space Qualified Applications.
- Single & Multichannel Versions to 40GHz.
- I, L & U Style.
- Roll-Rings®, Slip-Ring Assemblies & Roll-Blocks.
- Rotary Joint Repair & Refurbishment Available.

Electro Photonics
c
- RF & Microwave Test Fixtures to 18GHz.
- 90° Surface Mount Hybrid Couplers.
- Surface Mount Directional Couplers & Power Dividers.
- Mounting Tabs, Spiral Inductors & Transmission Lines.

Erzla
c
- Space & MIL Qualified Products.
- RF Power & Low Noise Amplifiers.
- Integrated Microwave Assemblies (IMAs).
- Data Links for UAV, Intelligence & Surveillance.
- EGSE, SCOE & Test Systems for Space Ground Support.

Euronano
c
- Analogue Fibre-Optic Links for:-
- Satellite Communications: 70MHz/140MHz IF, L-Band, Ku & Ka Band.
- Radar Systems: including Fibre-Optic Delay Lines for Radar System test use.
ANALOGUE, DIGITAL, RF, MICROWAVE & MILLIMETRIC COMPONENTS & SUB-SYSTEMS

Exodus Advanced Communications
- RF Amplifier Modules & Systems from 10kHz to 40GHz.
- Power Levels Exceeding 1kW for Modules & 10kW for Systems.
- LDMOS, GaN & GaAsFET Discrete Devices, Hybrid Chip & Wire Technology.
- Linear, Broadband & Pulsed Amplifier Modules.
- High Power RF & Microwave Modules & Systems.
- High Power RF Communication Equipment & Accessories.

Farran Technology
- Millimeter Wave Components & Systems to 500GHz.
- Frequency Extension Products for VNAas/PNAas/PNA-Xs, SAs, NFAs & Signal Generators (40 to 500GHz).
- Low Cost mmWave, 2 Port VNA Test Solutions (50 to 110GHz).
- Frequency Extension Controller Modules & Extender Calibration Kits (40 to 500GHz).
- Noise Sources (40 to 170GHz) & Mixers (18 to 500GHz).
- FMCW Radar Front Ends (77GHz).
- Passive Imaging Front Ends (94, 183, 220 & 300GHz).
- LNAs, Medium & High Power Amplifiers (40 to 120GHz).
- Frequency Multipliers (20 to 325GHz).
- Mixers (18 to 500GHz).

GotMIC
- High Frequency MMIC Chips from 50 to 120GHz.
- MMIC Receivers, Transmitters & Front-End IC Solutions to 120GHz.
- MMIC Amplifiers, Mixers & Switches.
- MMIC Frequency Multipliers & Detectors.
- Evaluation Boards Available.

Guerrilla RF
- RFICs for Wireless Infrastructure, WiFi, Repeaters, Small-Cell, DAS, Instrumentation & Defence Comms.
- Infrastructure LNAs from 0.7 to 4.5GHz with NF to 0.5dB.
- High Power LNAs from 0.1 to 6GHz, +45dBm OIP3.
- Broadband LNAs & Linear Drivers from 0.1 to 6GHz.
- Bypass Mode LNAs.
- High Linearity Gain Blocks 0.05 to 3.8GHz.
- WLAN LNAs & PA Drivers from 4.9 to 6GHz.
- High Frequency Gain Blocks to 135GHz.
- Guerrilla “Armor” Protection Technology.

Herley-CTI
- Phase Locked Frequency Sources to 500GHz.
- Free Running Dielectric Frequency Sources.
- Direct & Indirect Synthesizers.
- Fast Switching, Broad Bandwidths & Miniature Designs.
- Coaxial & Crystal Oscillators up to 50GHz.
- Block Up/Downconverter Modules for SatCom Applications.
- Aspen Stock a Wide Range of PDROs for Quick Delivery.

Hymeg
- Thick Film, High Voltage Resistors from 1 to 30kVDC.
- Precision Thick Film Axial Lead Resistors.
- High Voltage Thick Film Axial Lead Resistors.
- Precision High Voltage Plate Resistors & Dividers.
- High Value Non-Inductive Thick Film Resistors.
- High Power Non-Inductive Resistors.
- An Electro Technik Industries Company.

IF Engineering
- Low Frequency, Surface Mount & Coaxial Components from 100kHz to 6GHz.
- Power Dividers & Combines (2 Way to 32 Way).
- Directional Couplers & 90° Quad Hybrids.
- Vector Modulators (IQ).
- Phase Comparators & I&Q Demodulators.
- Multi-Couplers & Distribution Amplifiers.

Integrated Microwave
- Ceramic Filters from 500kHz to 1GHz.
- Bandpass & Bandstop Filters.
- Highpass & Lowpass Filters.
- Ceramic Coaxial Resonators.
- Diplexers, Duplexers & Multipliers.

IntelliConnect
- High-Spec, Multi-Pin Interconnect Solutions.
- ABMS Jacks & Plugs, BNC, N-Type, Push-Pull Jacks & Plugs, SMA & TNC.
- MIL-Aerospace, SCADA, Marine, Medical, Transportation, Oil & Gas.

JQL Electronics
- RF Ferrite Isolators & Circulators.
- Coaxial Designs to 18GHz.
- Waveguide Designs to 100GHz.
- Power Dividers & Combiners.
- Directional Couplers.
- Ceramic Filters to 10GHz.
- Power Transformers.

KDS
- Miniature Crystal Resonators to 80MHz.
- Miniature Crystal Oscillators to 212.5MHz.
- XO, VCOs, TCXOs & OCXOs.
- Miniature Monolithic Crystal Filters to 160MHz.
- Optical Quartz Products.
- Automotive Crystal Products to 64MHz.

Keysight Technologies
- Hi-Reliability Electromechanical Coaxial Switches to 40GHz, providing Absolute Measurement Certainty & Long Life to 5,000,000 Cycles.
- Adaptors, Amplifiers & Attenuators.
- DC Blocks & Diode Detectors.
- Directional Couplers & Bridges.
- Power Limiters, Dividers & Splitters.
- Solid State PIN Switches.

Koaxis
- Coaxial Cable Assemblies & Connectors for Defence, Telecommunications & Cable TV Applications to 60GHz.
- 50Q, 75Q (CATV), Hand-Formable, Semi-Rigid, & Flexible RG Assemblies.
- K-Flex™ 047, 086 & 341 Flexible Alternatives to Semi-Rigid.
- Low Loss Microwave Assemblies.

KVG Quartz Crystal Technology
- Standard & Precision Ceramic Crystals to 300MHz.
- Crystal Oscillators: XO, VCOs, TCXOs & OCXOs to 2.5GHz.
- Ultra-Low g-Sensitivity OCXOs & TCXOs.
- Crystal Filters: MCF, Discrete & Discriminators to 200MHz.
- ESCC “Qualified Parts List” for Space Applications.
- Custom Quartz Crystal Products Available.

L-3 Narda-ATM
- Waveguide & Coaxial Components to 220GHz.
- Waveguide to Coaxial Adaptors, Waveguide Transitions.
- Solid & Flexible Waveguide Components & Assemblies.
- Splitters, Directional Couplers & Hybrid Couplers.
- Waveguide Hardware, Flanges, Gaskets, Shims & Spacers, Clamps & Hangers, Bulkhead Feed-Throughs, Pressure Windows & Pressurisation Sections.
- Quick Disconnects.
- Phase Shifters, Line Switchers & Attenuators.
- Low, Medium & High Power Terminations & Shorts.
- Fixed, Continuously Variable & Step Attenuators.
- Horn Antennas from WR975 to WRS.
- Electromechanical & PIN Diode Coaxial Switches.
- Noise Sources, Bias Tees, DC Blocks & Coaxial Cables.
COMPONENT PRODUCT PRINCIPALS
ANALOGUE, DIGITAL, RF, MICROWAVE & MILLIMETRIC COMPONENTS & SUB-SYSTEMS

**Laird Technologies**
- In-Building, CPE, Access Point & Mobile Client Antennas.
- Base Station & Backhaul Antennas.
- Mobile Radio & RFID Antennas.
- Vehicular Antennas & Telematics.

**Lorch Microwave**
- RF & Microwave Filters to 40GHz.
- Cavity, Ceramic, Discrete, Tubular & Waveguide Filters.
- Manual & Digital Tuneable Filters.
- Duplexers & Switched Filter Banks.
- Voltage Controlled Attenuators.

**Marki Microwave**
- Passive & Active Components to 67GHz.
- MMIC & Patented Microlicthic Mixers to 50GHz.
- T3 High Linearity Mixers to 40GHz.
- Legacy Double & Triple Balanced Mixers to 65GHz.
- Image Reject/SSB & IQ Special Function Mixers.
- LO Driver Amplifiers, MMICs, Baluns & Transformers to 67GHz.
- Bias Tees, & DC Blocks, SMD & Coaxial to 65GHz.
- Couplers & 3dB Quad Hybrids to 67GHz.
- Multipliers including Doublers, Triples & Quadruplers.
- Filters including Bandpass, Lowpass & Highpass.
- Resistive, Wilkinson, 2, 3 & 4 Way Power Dividers.

**Micro Lambda Wireless**
- YIG Tuned Products from 500MHz to 50GHz.
- YIG Oscillators.
- YIG Retros & Equivalents for Avantek™.
- Miniature YIG Oscillators including Surface Mount & T-08.
- YIG Bandpass & Band Reject Filters.
- Frequency Synthesizers & Multipliers.
- Bench Test Boxes, YIG Drivers & Controllers.
- Harmonic Generators & Integrated Products.

**Nedi**
- RF SAW Filters from 30MHz to 2.4GHz.
- IF SAW Filters & SAW Resonators from 50MHz to 1.6GHz.
- SAW Components in Leaded & Surface Mount Packages.
- ITAR FREE for Defence Applications.
- Monolithic Crystal Filters.

**QuinStar Pamtech**
- Cryogenic Components down to 0.01K° & up to 110GHz.
- Waveguide Circulators & Isolators.
- Coaxial Circulators & Isolators.
- Ferrite Switches, Terminations & Transitions.

**SJM Prewell**
- InGaP HBT MMIC Amplifiers from 5MHz to 6GHz for Commercial, Hi-Rel & Defence Applications.
- Mobile Infrastructure, Cellular, PCS, GSM, GPRS, WCDMA, WLAN, ISM, RFID & Fixed Wireless.
- Low Noise, Gain Block & Medium Power Amplifiers.
- IF Amplifiers for CATV, VHF/UHF Transmission & Receivers.
- SOT-26 Power Dividers.

**RFbeam Microwave**
- GaAs HBT, PHMFT & RF CMOS ICs for Wireless Comms.
- Power Amplifiers, Low Noise Amplifiers & Switches for WLAN 802.11a/b/g/n, Bluetooth, WiMAX, CDMA, GSM, GPS & Handset Applications.

**Spectratime**
- SmartTimings*2 Disciplining with Advanced Holdover Performance.
- iSource2* range of Crystal & Rubidium Sources for Precise Performance Applications.
- iSync2* range of Synchronisation OCXO & Rubidium Oscillators & Reference Clocks.

**Tepro**
- Precision & Ultra Precision Wire Wound, Metal Film, Thick & Thin Film Resistors.
- Close Tolerance with High Reliability.
- Current Shunt, Carbon Film, Surface Mount & Chassis Mount Resistors.
- Low Ohm Current Sensing Resistors.
- An Electro Technik Industries Company.
TEST & MEASUREMENT PRODUCT PRINCIPALS

OSCILLOSCOPES, POWER SUPPLIES, RF WATTMETERS, ANALYSERS, GENERATORS & MORE...

**Bird Technologies**
- The “Original & Best” Thruline® Wattmeters.
- Handheld VNA/Spectrum Analysers & Antenna Testers.
- PC & Rack-Mount Spectrum Analysers.
- Wafer Fab Specific, High Accuracy RF Power Measurement Systems.
- Handheld Analogue & Digital RF Power Meters & Wattmeters.

**BK Precision**
- An Extensive Range of Bench & Handheld Test Equipment.
- Oscilloscopes, Power Supplies, Electronic Loads, Signal Generators, Multimeters & much more.

**Cleverscope**
- PC Based Mixed Signal Digital Oscilloscopes.

**Farann Technology**
- Frequency Extension Products for VNAs/PNAs/PNA-Xs, SAs, NFAs & Signal Generators (40 to 500GHz).
- Low Cost mmWave, 2 Port VNA Test Solutions (50 to 110GHz).
- Frequency Extension Controller Modules & Extender Calibration Kits (40 to 500GHz).

**GW Instek**
- Compact, Touch Screen Oscilloscopes.
- Oscilloscopes from 70 to 500MHz.
- AC & DC Power Supplies.
- Waveform, Function & Arbitrary Waveform Generators.
- Spectrum Analyzers.
- Benchtop DMMs to 6½ Digits.
- Component Testers.
- Electrical Safety Testers.

**Keysight Technologies**
- Digital Oscilloscopes for all Applications & Budgets with Bandwidths from 70MHz to 1.5GHz featuring Touch Screen plus a Wide Range of Decade Software Option Models Available.
- Benchtop & Handheld DMMs, LCR Meters, Current Clamps, Cable/Antenna Testers & Spectrum Analyzers.
- Frequency Counters.
- Data Acquisition & Signal Switching Systems.
- Function & Arbitrary Waveform Generators.

**Micsig**
- High Performance Digital Handheld & Tablet Oscilloscopes with Bandwidths to 200MHz.

**Omicron**
- BODE 100 VNA for Applications from 1Hz to 40MHz.
- SPECTANO 100 Dielectric Material Analyser.
- IEEE 1588 Precision Time Protocol PTP Grandmaster Clock & PTP Converter Products.

**PicoTest**
- 50MHz Arbitrary Function Waveform Generators.
- 1Hz to 40MHz Vector Network Analyzers.
- 6½ Digit Digital Multimeters.
- 150W Lab Power Supplies.
- 12 Digit, 6GHz Universal Frequency Counters.

**Puissance Plus**
- Wide Range of Intelligent Power Conversion Products.
- AC & DC Programmable Power Supplies.
- AC & DC Four Quadrant Amplifiers from 500VA to 10kVA.
- DC Dynamic Electronic Loads from 3 to 600V & 0 to 5kA.
- Frequency Changers, 50/60/400MHz, Pure Sine.
- Grid Simulators.

**Saluki Technology**
- RF & Microwave Test Equipment including Signal Analysers, VNAs & Handheld Instruments for Applications to 67GHz.
- Millimeter Wave Extension Modules to 500GHz.

**Sefram**
- TV Analysers for DVB-T & T2, DVB-S & DVB-S2 plus MPEG2 to MPEG4 Decode.
- Digital Multichannel Dataloggers & Recorders.

**Tabor Electronics**
- World Class High Speed Arbitrary Waveform Generators & Function/Pulse Generators.
- Waveform Creation Software including Complex RF Modulation.
- Wideband Amplifiers.
- PCI/PXI Instruments.

**TDK Lambda**
- Programmable Power Supplies.
- Genesys range, 200W to 15kW, Rack Mount, 1U to 3U sizes.
- Z+ range, 200W to 800W, Rack Mount, Half-Width or Bench Versions.
- Custom Solutions Available.

**Wavecontrol**
- Radio Frequency & EMF Safety Monitoring Solutions for Worker Protection & Legislative Compliance.
- In-Situ Permanent Monitoring Systems.
- Handheld Portable Monitoring Systems.
- Large Area Electromagnetic Mapping Solutions.

**Wens**
- Handheld Battery Quality Analysers.
- Handheld Automotive Oscilloscope with Logic Analyzers.
- Handheld Graphical Digital Multimeters.

**X-COM Systems**
- RF Capture, Recording & Playback Systems.
- Spectro-X Spectrum Playback & Analysis Software.
- RF Editing & Creation Software.
- Multi-Channel, Independently Programmable, Broadband Signal Generators.
SERVICE & CALIBRATION

Aspen Electronics Ltd has been working with Bird Technologies since it first started in business over 40 years ago. As the Bird Technologies’ dedicated European Service Centre, we service, repair & calibrate the majority of Bird products at our West London facility. Our primary work is the calibration of RF power, plus the repair and refurbishment of High Power Loads and Attenuators.

To ensure we offer the best service possible, we recently invested in High Power Amplifiers, plus associated equipment to ensure we are able to generate spur free, high power RF signals, vital for good calibration.

Power measurements are made using our high accuracy, high repeatability, Bird Technologies metrology grade RF Wattmeters as transfer standards, plus very high accuracy broadband RF Calorimeters as primary standards. In addition, we use a variety of “special to type” test instruments to ensure your Bird Wattmeter is in optimum operating condition.

With additional equipment such as Spectrum Analysers, Network Analysers and many other instruments, Aspen Electronics is able to calibrate a wide range of RF & Microwave equipment. This facility also gives us the ability to support many of the RF & Microwave Components & Sub-Systems we offer.

DESIGN & MANUFACTURE

With more than 40 years’ experience of RF & Microwave Components & Systems, plus a well-equipped service facility, Aspen Electronics is able to design, manufacture and test “special to type” RF & Microwave Sub-Systems and Instrumentation products.

A High Power (2W), 40GHz Phase Locked Source with phase and amplitude control (above top).

A 3GHz Signal Generation and Conditioning System (above bottom).

These represent just some of the products we have built to customer specifications.

Whatever your requirements, our dedicated and experienced design team are here to help provide the right solution for your needs.