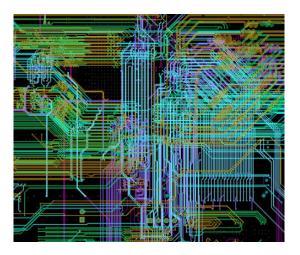# Capabilities Statement

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At **Perseus Technology**, we are experts in electronics design/electrical engineering, PCB layout, mechanical packaging, software development for large scale and embedded systems, system design, root cause failure analysis, production support and technology business process consulting. Whether you need help with an existing design or develop a product from scratch, our team can help you with a design that is ready for the market, fine-tuned for manufacturing, assembly, and test.

We can do full design from concept to production, or we can perform any parts of that design process that you need. We can work standalone or embedded within your existing team to give you the added manpower and subject matter expertise that you need to get your projects done on time and on budget.

Other services we offer include turnkey electronic prototypes and small volume production manufacturing, mechanical design, modeling and 3D printing and prototypes, circuit simulation, test system development, and obsolescence and lifecycle management to help you improve efficiency and effectiveness of your technical organization.

Electronics Design Capabilities

Schematic Capture – Our engineers capture your designs in Altium, Orcad and other tools as needed, in easy to read and accurate schematics that inform PCB layout, as well as other engineering activities.

PCB Layout – Expert PCB layout of rigid, flex and rigid-flex boards performed by engineers that understand the influence of material choices, layer stack-up, power distribution, signal integrity, floor planning and thermal control on the over success of your designs. We layout circuit boards in all materials (FR4/6/8, Rogers), with SMT, through-hole, blind and buried vias. Our process includes stack-up design, floor planning, component placement, signal routing and power distribution, impedance/length control of RF and high-speed digital circuits, design for manufacture (DFM), design for test (DFT) and design for assembly (DFA). We specialize in mixed signal designs that include power, digital, analog and RF circuits all on the same board. We deliver completed designs with fabrication data (Gerber, ODB++, netlist, etc.) and fabrication/assembly drawings ready for manufacturing.

AC Power – AC to DC power supplies, Power Factor Correction, EMI/EMC.

DC Power – Isolated and non-isolated DC to DC power supplies, dual source inputs, current management, over-voltage and over-current protection, designed for stability and transient response (bode analysis, and frequency response analysis), efficiency, noise and accuracy to your specifications.

Digital – Discrete logic and programable logic (FPGA and CPLD) designs using VHDL and Verilog, High performance timing closure, sensor interfacing, sensor synchronization, ADC sampling control, Digital Signal Processing (DSP) functions, High speed memory and serial interfaces, serial and parallel buses including 1-Wire, USB, SMB, RS-232/422/485, MIL-STD-1553, I2C, SPI, CAN, Ethernet, PCI, PCI Express (PCIe), Ethernet, microcontrollers and microprocessors, DisplayPort, HDMI, memory systems (ROM, FLASH, SDRAM, DDR2/3/4/5), and JESD204B.

Analog – Signal conditioning, amplifiers (discrete and module based), voltage regulation, active and discrete passive filters (lowpass, bandpass, high-pass and tunable), load control, impedance matching, EMI/EMI compliance, surge transient and ESD protection, Op-Amps, BJT and MOSFET based circuit design, Analog to Digital (ADC) and Digital to Analog (DAC), low noise designs, and audio circuits.

RF – DC to 12 GHz, discrete, IC and MMIC based designs including, amplifiers, mixers, tuners, transmitters, receivers, low noise front-end design, low phase noise Local Oscillators (LO), I/Q mod/demodulators, discrete and printed filters, impedance matching, antenna integration, attenuators and more.

Lab Support – Board level, and systems level testing and troubleshooting using lab and field instruments including but not limited to digital multimeters (DMM), oscilloscopes, logic analyzers, spectrum/frequency response analyzers, network

analyzers, time-domain reflectometry (TDR), phase noise test sets, function/signal generators power sources and electronic loads, thermal cameras/thermocouples.

Analysis/Test – Engineering analysis of circuits for tolerance, sensitivity to environmental effects due to temperature, humidity, shock, vibration, EMI/EMC/ESD and atmospheric/pressure environments (i.e. space vacuum). Simulation of circuits using Spice, and development of testing protocols and procedures for design verification, qualification and acceptance. Capabilities include the use of RF simulations systems such as ADS, Genesys, and microwave office to predict system and circuit, S-parameters, gain, phase, power, bandwidth, linearity and more.

Mechanical and Packaging Design

Mechanical Design – 2D and 3D CAD modeling and design of packaging and structures for electronic circuits and systems using SolidWorks and AutoCAD. Design can be optimized for many materials including metals and plastics and manufacturing processes including injection molding, CNC machining, and more.

Electronics Co Design – Interactive 3D design between PCB layout and CAD systems to provide accurate modelling and virtual fit check of electronics design within the allocated mechanical envelopes and structures.

Prototyping – We have inhouse 3D printing capabilities (256mm x 256mm x256mm) in various materials including some with fiber reinforcement (PLA/PLA-CF, PET/PETG, ABS) Through our partners we can provide larger scale 3D printing with more diverse materials, and CNC machined parts for quick turn prototypes.

Engineering Support

Electrical Engineering – We work standalone or on-site to provide your team with additional manpower and expertise for your engineering team. That includes for all our capabilities listed including process improvement, source selection/evaluation, component lifecycle and obsolescence management, failure analysis (root cause and corrective action), presentation and proposal support, merger and acquisition support, technical review and evaluations.

Systems Engineering – From concept to commissioning we support all aspects of the system development cycle including architecture, component and interface definitions, data and system requirements, subsystem definition, detailed design, implementation, and verification.

Software and Firmware

Software – We can develop software for various applications including user interfaces, using a wide range of languages, C/C++, Python, Java, assembly and others on platforms ranging from embedded systems, desktops, servers, and internet based, targeting Windows, Linux, and other real time operating systems (RTOS) including VxWorks.

Firmware – Our team are experts in firmware for your embedded systems for microcontrollers, microprocessors, system on chip (SOC) and system on module (SOM) platforms. Included in our capabilities are advanced design of firmware for SOCs, FPGAs and CPLDs using Verilog and VHDL.

Databases – Design and development of relational databases.

Manufacturing Support

Electronic Prototypes/low volume production – we partner with best of breed suppliers to provide quick turn electronic PCB prototyping/low volume production including PCB fabrication, electrical test, assembly, component procurement, and conformal coating.

Bare PCB Fabrication – PCB fabrication services of rigid, flex, rigid flex and hybrid (mixed material) to your specifications, using all material types (FR4, Rogers, etc.), with low and high layer count capabilities, Surface Mount (SMT), through-hole, blind and buried vias, via in pad, high density (HDI), single and double sided, impedance controlled, all available surface finishes, and electrical test.

Testing and programming – Development and consulting on programming and test systems for development, functional, compliance (EMI/EMC/ESD, IEC, EN, UL, FCC, MIL-STD-461), acceptance and qualification testing of circuit cards and electronics assemblies/systems using onboard connectors, In-Circuit Test (ICT), JTAG, serial programming and more.

Past Projects

Our past projects have included line, DC and battery powered electronics for custom indoor and outdoor, rack mounted and handheld systems. Our designs are found in systems for commercial, industrial, military/defense and aerospace markets. Examples include microwave point to point radios, see through the wall devices, mine detectors, troposcatter radios, laser rangefinder/designators, VHF/UHF radios, VSAT Block Up Converters, flight computers and more.

Why Perseus Technology?

We are engineers that understand the technical requirements, **and** the business needs of our customers. **We deliver on our promises** and ensure our projects meet all your requirements and that includes schedule and budget. Our goal is to be your engineering heroes that are trusted and valued resources for your organization.

Ready to get started?

Call or Email today to get started!

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