Left Coast Engineering
a dba of Park-Tours, Inc.
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LEFT COAST ENGINEERING®
You think it. We build it.™

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Summary

Since its inception, Left Coast Engineering (LCE) has specialized in product design and engineering technology for military, industrial, and commercial applications. LCE has a 19 year track record as a small business and has steered more than 135 designs from start to finish, each with its own unique set of challenges to overcome. Because each project incorporates visionary and sometimes ground-breaking technology, the engineers at LCE approach design in a non-traditional, innovative, and pioneering way, allowing them to most efficiently address new design requirements that have never before been encountered. This approach is demonstrated in its typical design cycle which includes iterations of investigation, prototyping and refinement until design goals are met. LCE is a full service resource from concept to production, including product definition, certification testing, production test and intellectual property protection.

Capabilities / Core Competencies

- **PCB Design** - PCB (Printed Circuit Board) Layout, RF Layouts, High Speed Digital Logic, Wirebond
- **Sensors** - Precision Instrumentation, Precision Delta Temperature Sensors, Salinity, Conductivity, Photon Counters, Pressure, Humidity
- **Firmware/Software** - Embedded, Linux OS (Operating System) / Apps, Android OS / Apps, Device Drivers, Windows Apps, C++, Java, DSP (Digital Signal Processing / Processor), Network Protocols, Multi-User Wireless Systems, Multi-Hop Systems
- **Product Design** – RF (Radio Frequency), Power Supply, Audio, Digital, FPGA (Field Programmable Gate Array)/CPLD (Complex Programmable Logic Device), Firmware, Software
- **RF** - RF Design, Antenna Design, RF Validation and Testing, RF Architecture, RF IC (Integrated Circuit) Design, Labview Programming, PCB (Printed Circuit Board) Layout, Link Budgets, Propagation
- **Audio** - High-End Consumer Audio Design, High-Power Power Supplies, DSP, Active & Passive Crossovers, Parametric EQ (Equalization), Amps and Preamps
- **Digital Design** – ASIC (Application Specific Integrated Circuit), FPGA and CPLD Designs, Schematic Capture, Documentation, Verilog, VHDL (a hardware description language), Test Benches
- **Power Supplies** - Power Supply Design, Switched-Mode Supplies, Power Transmission, Magnetics

Key Personnel

Robert Baranowski – Founder and project manager with 23 years of electrical design experience for both military and commercial projects with extensive hardware design experience in wireless, power, audio, controllers, location-aware and sensors. His software design and development experience involves user interfaces, drivers and applications. He is an inventor on more than 18 issued patents.

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Past Performance

Military and Government: LCE has designed more than 25 electronic products as a second-tier on highly classified systems for multiple agencies over the past 10 years, with projects ranging from several months to more than a year. With a proven track record of solving intricate, difficult, high-tech challenges, LCE is able to consistently provide innovative solutions for its customers. Highlights include:

- **GPS (Global Positioning System) Location-Aware Wireless Modem –** small, standalone, for field deployment including satellite and Local Area Network communications. Challenges - interference between different on-board radios and tricky thermal issues.
- **Mission Termination System** - Embedded firmware and control software. Challenges – Size, weight, ruggedness, and reliability.
- **Audio/Video Surveillance System** - Audio detection and control hardware to capture directional video surveillance based on audio event triggers.
- **High Powered DC-DC Ruggedized Radio Power Supply** - Designed and certified the electronics for vehicular deployment. Challenges - robust input circuit capable of performing circuit-breaker type functionality while not responding to transients seen from the typical "dirty" power sources.
- **High-Powered Acoustic Defense System** - Designed amplifier and power supply. Challenges - High gains required very low noise input circuits, redesigned front ends and audio sources to exceed system specifications.
- **Portable MIMO (Multiple Input Multiple Output) Communications Hub** – Hardware design for temporary infrastructure in disaster situations and overseas camp installations.
- **Dual 30VDC Output Power Supply** – Designed with tight voltage range tolerances in a small package.

Commercial: Designs completed by LCE fall into a broad range of categories, from car location devices that use custom directional antennas with an advanced algorithm to determine direction of an incoming signal, to wireless object detectors that sense the presence of targets over relatively short distances. As each new set of requirements arises, the LCE team finds the optimal, most effective way to get the job done.

- **Portable TEMT Device** – Finalizing wearable units for a study on the use of RF in the treatment of Alzheimer's Disease. Despite limited requirements, created electrical and interface specs, exceeding specifications.
- **Portable Real-Time Pathogen Detector** – Prototypes developed for the food industry, included detection hardware, control hardware, detection algorithm, touch-screen user interface, PC-based support apps for network configuration and data gathering, dynamic sensor monitoring, and remote experiment management.
- **Precision Delta Temperature Detector** - Device detects and records extremely small variations in temperature to a billionth of a degree. Electronics include hardware, control, advanced sensor technology, and user interface that walks users through experiments and controls the motors, valves, and pumps integrated into the device. Created a PC-based application for post-processing and analysis of experiment data.
- **Wireless Subterranean Soil Monitor** – Designed system, product architecture and partitioning, complete hardware implementation, antenna design, networking protocol, embedded firmware, irrigation control, and all production test and configuration for multiple product generations. Dynamic mesh networking adapts to environmental and configurational changes and monitors network health while providing soil monitoring functions. Uses a dual-band radio to overcome the challenges of harsh underground, wet, and dry RF environments with primarily battery-driven components.
  - Currently enhancing the 4th generation of this product, reducing product size while increasing communications range and reducing power requirements.
  - Overcame design and performance challenges of variable conditions of probe environment (very dry to completely submerged in water) and difficult underground requirements with specific antenna and protocol design.
  - Increased communications range by 72% over initial specifications.