

Robert L. Dickerman
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PROFESSIONAL EXPERIENCE:

Proprietary Product Development; February 2012 – present

Development of proprietary products and intellectual property, including an appliance energy meter using PIC microcontrollers, and including innovations in consumer and automotive products, signal processing, and instrumentation.

Electronics Engineering Consultant

Cox Environmental Systems, Marshfield, MA; January 2011 – February 2012

Designed circuitry, including schematics and artwork, for five different printed circuit boards (PCBs), including photodetector, lamp, spectrometer, and test fixture interfaces, and a sensor product. Assembled four of the PCBs, tested hardware, wrote simple C software to test sensor hardware interfaces and TMS320 debugger interface, prior to delivery to software developers.

Special Projects Team, LLC, South Deerfield, MA; May 2009 – November 2010

Electronics technician on radiometer project. Specified data acquisition system, helped with system integration, wired system, made wiring drawings. Reviewed artwork for signal conditioning amplifier PCB and recommended changes. Tested system indoors and outdoors. Specified and tested parts of flight monitoring and communications equipment, changes to deployment cart. Flight engineer on initial aerial test of radiometer.

Trex Enterprises, Hatfield, MA; May 2007 – June 2010

Did production testing and repair of millimeter-wave amplifiers, and helped design a related biasing test fixture. Made schematics and artwork for four baseband and biasing PCBs. Helped design baseband signal processing and biasing circuits for a millimeter-wave RADAR system.

Argotec, Inc., Greenfield, MA; December 2003 – March 2007

Specified and tested a data acquisition unit, and wrote a small Visual Basic for Applications program to make the system easier to use. Assembled and tested a motion controller, and wrote Galil motion control software and a rudimentary Visual Foxpro software user interface. Repaired various electronic equipments, and set up several industrial controller/PC serial interfaces.

ABB PPL, Windsor, CT; March 1998 – May 2002

Helped to design, build, and test several boiler instruments, including an acoustic tester, an efficiency measuring instrument, a combination efficiency/wastage instrument, which included a 50 Ampere current source and a microvoltmeter with resolution of 25 nV, and a phased-array ultrasonic test instrument. Designed with, and wrote code for, PIC microcontrollers. Created schematics and PCB artwork.

ABB AMDATA, Windsor, CT; February 1992 - March 1998

Designed the logic schematics for a dual quadrature optical encoder interface board, which is a half-length surface-mount ISA bus expansion board, for measuring Non-Destructive Evaluation (NDE) scanner motion. The logic, which was implemented in a 4000-gate QuickLogic Field Programmable Gate Array (FPGA), includes a novel circuit for which a patent disclosure has been filed.

Designed an Ultrasonic Test System Board. This board is a full-length surface-mount ISA bus expansion board, which, when used with proprietary software and ultrasonic transducers, allows a PC to be used as an ultrasonic test instrument. The analog section includes an adjustable 400V switching power supply, two high-voltage pulse generators, and two amplifier channels of 30 MHz bandwidth and up to 60 dB of gain. The receiver gain can be varied during acquisition according to a user-selectable pattern stored in SRAM.

The receivers feed an 8-bit, 100 MS/s A-to-D converter. The data can be compressed with digital "rectify and peak-pick" circuits and threshold-based run-length encoding circuits before storage in FIFO memory. Also available are digital interface and flaw gates which peak-pick or record the time of threshold crossings. Waveform data is transferred to the PC using 16-bit I/O mapped and DMA bus interfaces. A dual quadrature encoder interface is included to detect scanner motion. Most of the digital logic is implemented in four 4000-gate QuickLogic FPGA's.

In other projects, I cured a persistent 100 MHz ECL A-to-D board problem in an older product, helped cure a printing problem which occurred when using the Lynx real-time operating system, and applied a DSP deconvolution algorithm using Z-transforms and modeled the results using Mathcad.

Equipment Sales; May 2002 – December 2003

Bought and sold electronic equipment using eBay and website.

Electronics Engineer at Langley Ford Instruments, Amherst, MA; March 1982 - Dec. 1991

Langley Ford manufactured particle characterization instruments. My initial responsibilities there included production testing and field service, and progressed to circuit and system design. In 1989, I became manager of the electronics design group.

I designed analog proportional controllers for temperature and laser control, low-voltage and high-voltage linear and switching power supplies, and a mirror speed controller for a laser doppler velocimeter. I typically used Bode plots and behavioral simulators for stability analysis, and step, swept-sine or random-noise stimulus for plant characterization and final response and stability characterization. I also designed discrete-time proportional controller algorithms for temperature and liquid-level control.

Senior Associate Engineer at IBM, Poughkeepsie, NY; June 1978 - March 1982

Created d.c. statistical computer model for power bipolar transistor used by power supply designers. Redesigned two logic-level converter integrated circuits. Analyzed pulse excitation of transmission lines with non-linear terminations. Analyzed and released new TTL line driver.

Engineering Assistant at EG&G, Idaho Falls, ID; June 1977 - August 1977

Developed conceptual design for instrumentation in loss-of-flow test loop intended for simulation of nuclear reactor.

EDUCATION:

Syracuse University at Marist College, Poughkeepsie, NY

Graduate courses in Electromagnetics, Active Circuit Analysis and Synthesis, Z80 Assembly Language Programming, Digital Image Processing, 1978 - 1982.

University of Massachusetts, Amherst, MA

B.S. in Electrical and Computer Engineering, 1978. Received Massachusetts Board of Higher Education Honors Scholarship, UMASS Scholarship, and TRW Foundation Scholarship. Member of Tau Beta Pi, Eta Kappa Nu, IEEE.

CERTIFICATIONS, PATENTS, AND LICENSES:

Massachusetts Engineer-In-Training Certificate No. 13772

FCC Extra Class Amateur Radio License

U.S. Patent No. 5,837,899: Ultrasonic Testing System

U.S. Patent No. 6,750,660: Electrical Characteristics Tester

U.S. Patent No. 8,963,730: Maintenance Warning Inhibitor Based on Time of Day

U.S. Patent No. 9,751,444: Electrostatic Discharge Mitigator for Vehicles

U.S. Patent No. 10,433,614: Static Dissipation Modifications for Shoes

U.S. Patent No. 10,507,749: Electrostatic Discharge Mitigator for Vehicles

U.S. Patent No. 10,601,630: Quadrature Signal Imbalance Estimation