

PROFESSIONAL SUMMARY

Expert Analog Design Engineer and Consultancy Business Owner with an active 30-year career resulting in a strong reference portfolio, Thirteen U.S. Patents (see List of Patents), and an emphasis in motor drives, medical/industrial equipment and computer peripherals.

PROFESSIONAL EXPERIENCE

Triple Ring Technologies | Newark, California

Apr 12 – May 17

Principal Analog Engineer at Triple Ring Technologies, a high-tech consultancy group and incubator for medical, industrial, defense and security companies and solutions

- Designed:
 - Third-generation low-cost, low-power electron beam deflection system for scanned beam X-ray source (linear power amplifier with pulsed power supply rail controlled and monitored by an FPGA);
 - laser power supply for phototherapy equipment;
 - amplifiers for Sensl silicon photomultiplier;
 - microwave loop-gap resonator for electron spin resonance oxygen sensor;
 - test fixture electronics for drug pump;
 - low noise light source drivers and sensing circuits for a diffuse optical tomography system and an optical renal function monitor.
- Redesigned:
 - Control loop of 80kV, 40W X-ray power supply.
- Debugged:
 - Slipping step motor drive on IV pump.

Wright Speed, Inc. | San Jose, California

Jan 11 – Apr 12

Senior Hardware Engineer at Wrightspeed, an electric vehicle powertrain manufacturer.

- Designed: 200kW PMSM traction drive power stage, 2.2kW DC-DC converter and 6kW battery charger for a hybrid delivery truck power train.

Fellingham & Associates | San Jose, California

Jun 95 – Dec 10

Principal Analog Design Engineer and business owner at Fellingham & Associates, a consultancy focused on hardware designs for medical and industrial electronics manufacturers, including:

- Aerogen - Piezoelectric aerosol generator, drivers and control electronics for ultrasonic nebulizer & inhaler.
- Alexza - Electronics for prototype drug delivery device.
- BioElectromed - Signal processing development for bioelectric field imager.
- Cardiac Mariners –Second-generation 2kW linear amplifier for magnetic electron beam deflection in scanned-beam X-ray system.
- Cardiovention - FPGA-based air purge valve controller for heart-lung bypass machine. EMI system debug.
- Dean Miller Associates - Medical RF ablation power sources (3W to 200W at 500kHz), high-speed high-voltage Q-switch driver and other support circuits for medical laser.
- Dimatix - Discrete transistor power amplifiers for ink jet nozzle drive.
- Doggicam Systems - Electronics and microcontroller firmware for 35mm motion picture camera remote head, motion capture/playback system, gyro stabilizer, power slide and super slide.
- Hybrid Networks - Upstream receiver line card for broadband wireless internet access, wireless modem debug – RF circuit design and FPGA design using Altera devices with VHDL.
- Litrex - FPGA-based ISA-bus inkjet print head driver card, programmable waveform driver-per-nozzle inkjet head driver.
- Nektar - Inhaler electronics debug, aerosol generator test equipment development.
- Nonsequitur Technology - Ion beam deflection system, USB analog I/O board for system control.
- Norand Corporation - Switching power supplies and battery chargers for hand-held computers.
- Panelvision Technology - Electron gun and deflection electronics, panel drivers for LCD panel tester.
- Pocket Science - Analog design, ESD debug for pocket email device.
- Specialized Bicycles - Bike light electronics.
- Sportbrain - Analog ASIC test board.
- Terumo Mission Medical - Specified and tuned DSP motor controller for cell-separating blood pump, produced electronics for experimental cell separator, centrifuge blood-level sensing, step motor drives, EMI debugging.
- Topaz Technologies - Piezoelectric print head drive amplifier, long-range IR paper sensor for ink-jet printers.
- Triple Ring Technologies - Multi-channel photomultiplier amplifier, multi-channel bio-impedance measurement system front end, low level optical measurement system hardware, MEMS oscillator, and scanned beam X-ray system electronics.
- Other (Private Enterprise) – Drive electronics for a thermal liquid dispenser; spark ignition for small gas engines; and remote controlled pan-tilt head for digital SLR cameras.

Cardiac Mariners | Santa Cruz, California**Aug 93 – Jun 95****Senior Analog Engineer at Cardiac Mariners, a scanned-beam X-ray systems manufacturer.**

- Designed/Built: 96-channel video amplifier/discriminator for a multi-channel scintillation detector (input pulses are typically 50ns by 100mV).
- Developed: First-generation liquid-cooled scan amplifier board, providing electron beam deflection, focus and astigmatism correction, including a beam stepper capable of moving one pixel in 100ns.

Raster Graphics | Sunnyvale, California**Nov 99 – Jul 93****Senior Electrical Engineer (EE) at Raster Graphics Inc., a manufacturer of electrostatic plotters.**

- Designed: Two generations of analog electronics for the writing head on D and E-size plotters. Secured Regulatory Agency - Safety and EMI - Approvals with UL, CSA, TUV, FCC, VDE and VCCI standards.
- Designed: Multi-output (5V to 500V) power supplies up to 400W with power factor correction and motor driver/sensor boards.
- Developed: High-density thick film resistor process, test hardware and software.
- Supervised: Development of a high-voltage IC tester for head drivers.

Circadian | San Jose, California**Jun 87 – Sep 88****Senior EE at Circadian, San Jose, CA, a medical electronics manufacturer.**

- Redesigned: Hybrid EKG instrumentation amplifier to improve yield and reduce cost by eliminating active trimming.
- Rescued: Treadmill motor drive project, putting it back on schedule by replacing an unreliable 1 kW MOSFET motor drive with an off-the-shelf SCR drive.
- Solved: EMI problems on analog tape decks in treadmill and Holter monitor systems.

Oximetrix/Abbott Labs | Mountain View, California**Jan 84 – Jun 87****Member of Technical Staff at Oximetrix/Abbott Labs, a medical instrument manufacturer.**

- Developed: Analog electronics for Life Care 5000 IV pump (from concept to pilot production). Development Included: Ultrasonic-bubble and strain-gauge pressure sensors and their electronics; step motor drives; power supply/battery charger; software algorithms for testing fluid valves with a pressure sensor, and for software damping of step motors.

DV International | Saratoga, California**Jan 83 – Dec 83****Electrical Engineer at DV International, a cartridge tape drive manufacturer.**

- Developed: Prototype cartridge-speed and head-position servos and a read-head amplifier for a high-performance cartridge drive.

CSIR | Pretoria, South Africa**Jan 82 – Jan 83****Research Officer at National Institute for Aeronautics and Systems Technology, CSIR.**

- Researched and Evaluated: Applications for digital adaptive filtering. Built and Tested: Analog adaptive filter.

EDUCATION

BS Electrical Engineering, with Honors, from University of Cape Town, South Africa. Postgraduate courses in control systems and stochastic signal processing at University of Pretoria.

Other US citizen since 1983. IEEE member.

PATENTS

US7757632 Waveform generator for microdeposition control system. Issued: July 20, 2010.
US7673820 Subminiature thermoelectric liquid dispenser. Issued: March 9, 2010.
US7449070 Waveform generator for microdeposition control system. Issued: November 11, 2008. Company: Ulvac, Inc.
US5682412 X-ray source. Issued: October 28, 1997. Company: Cardiac Mariners, Inc.
US5191795 Ultrasonic detector. Issued: March 9, 1993. Company: Abbott Laboratories.
US5181050 Method of fabricating an integrated thick-film electrostatic writing head incorporating in-line-resistors. Issued: January 19, 1993. Company: Raster Graphics, Inc.
US5128697 Integrated thick film electrostatic writing head incorporating in-line resistors and method of fabricating same. Issued: July 7, 1992. Company: Raster Graphics, Inc.
US4977416 Integrated thick film electrostatic writing head. Issued: December 11, 1990. Company: Raster Graphics, Inc.
US4950244 Pressure sensor assembly for disposable pump cassette. Issued: August 29, 1990. Company: Abbott Laboratories.
US4944191 Ultrasonic detector. Issued: July 31, 1990. Company: Abbott Laboratories.
US4821558 Ultrasonic detector. Issued: April 18, 1989. Company: Abbott Laboratories.
US4818186 Drive mechanism for disposable fluid infusion pumping cassette. Issued: April 4, 1989. Company: Abbott Laboratories.
WO1996025024 X-ray Source. Issued: August 19, 1996. Company: Cardiac Mariners, Inc.
EP0871973 X-ray Source. Issued: May 28, 2003. Company: Cardiac Mariners, Inc.
EP0496436 Device for detecting the absence of a liquid in a conduit. Issued: July 29, 1992. Company: Abbott Laboratories.
EP0495538 Device for detecting air in a fluid pump cassette. Issued: April 15, 1992. Company: Abbott Laboratories.