

## Ronald Selman

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**Objective:** Electrical Engineering

**Summary:** Over 12.5 years experience designing world class electronics. Has rigorous technical expertise in digital, analog, and programming disciplines with many significant contributions to new product releases, from inception of design concept through pilot manufacturing runs. High volume productivity in assignments and maintains intensive attention to detail thus resulting in a high reliability product. Generates, elicits, and maintains a productive work environment.

### **Skills and Accomplishments:**

Assigned Engineering Project Lead of Beta level Stylus-NanoProfilometer Hardware Development. SNP tool needed to be finished for customer acceptance testing in short time frame. Finished designs of electronic motion control, and electro-mechanical sub-systems; additionally cable assemblies, Mains power distribution, UPS power distribution, chassis parts, cameras, microscopes, and was principle for CE Mark compliance. Shipped Beta unit on schedule, passed on-site acceptance testing and received prompt payment.

Co-developer of 5 axis motion control using 3 phase servo motors, servo amplifiers, ultra vacuum micro stepper motors, Galil Motion controller, and Intelligent Motion step motor controllers. Linear encoder installation, alignment, and adjustment to facilitate balanced sine and cosine waveforms for 64X interpolators. Extensive TTL/Opto input/output circuits to OEM products like pneumatic valves, fans, heaters, water coolers, and door switches.

Motion Stage for 300<sub>mm</sub><sup>2</sup> wafer positioning is delivered with low rate positioning errors. In timely fashion make precision alignment of glass slide linear encoders using oscilloscope X vs. Y mode for symmetric circle trace. Calibrate 64X interpolator modules and make very robust encoder operation. Generate work instructions for alignment of glass slide linear encoders for release to manufacturing and Field Service. I wrote many motion control scripts for reliability testing.

Sustaining with extensive schematic improvements, layout changes, and BOM upgrades for 4 axis low noise Analog Step Motor controller, Bi-polar 500W electromagnet linear power supply, and ultra low noise and high speed DAQ sub-system. Electronics lead of 4 axis servo motor sub-system integrating it to legacy motion control electronics. Modify CPLD / FPGA with schematic logic or VERILOG.

Principle designer of 3 angstrom resolution Capacitive Distance Measurement PCBA, I utilized complex OpAmp and signal generation circuits to achieve 30<sub>ppm</sub> accuracy. Built pilot production run then released and shipped to customer base / F.G.I.. DAQ PCBA is not performing to 16 bit accuracy even with large sample size averaging; designed higher performance replacement with 3X speed increase and 16 bit accuracy with small sample size.

Design ~100 printed circuit board layouts of high performance Hard Disk Read/Write Head probe cards for high bandwidth Quasi-Static test instrument. Controlled impedance trace layout (to 1.2GHz) for signal analysis of +10 micro-volt level noise generated by R/W heads under magnetic field. Rigid dimensional criteria with numerous placement restrictions and exact polygon copper shapes. Connectivity varies between vendor Read/Write head preamplifiers requiring complex datasheets to determine characteristic impedances, signal descriptions, PECL levels etc.

Developed Hot/Cold option for bench top model Quasi Static tool; this facilitated testing of R/W heads under controlled temperatures from 5° to 120° Celsius.

Implemented SOP-39 Safety upgrades to capital equipment in-line Quasi Static tool. Designed Mains Interlock Box to EN-61010 compliance with multi-level cut off, door switches, EMO, and status logic. Upgrade schematics and wiring of sub-systems, place door switches, specify safety labels, reject non S8 compliant monitor stand, verify electrical components for safety licenses. Verify flame ratings on plastic components. Product version passed the Safety Agency audit first time and was accepted by the specifying customer without incident. Design changes made were then implemented in all tool versions.

Mains Power Interlock Sub-system for SNP tool is hard to manufacture. Need SEMI S2-0302 compliant sub-system with PCBA that is easy to assemble. Design circuit and layout PCB that meets all compliance requirements for Mains power traces such as creepage, clearance, and ampacity. Meet or exceed all EN-61010 requirements for the sub-system such as safety ground, wire insulation, wire ampacity, and interrupting capacity. As co-developer of SNP ancillary sub-systems for 24 channel I/O functions and 16 slot Precision DAQ backplane; I designed and released to production safety compliant electrical wiring circuits. This was very successful and passed SEMI S2-0302 without incident and met all additional customer in-house requirements such as EMO interlock, and EMO accessory powering.

Design SNP Mains power distribution system to meet specific customer in-house safety compliance requirements. No non-removable power cords (traditional power strips) allowed on tool. Using flexible conduit placed custom AC outlet box with varied fused AC Outlets that sourced all power cords.

Non-contact wire extrusion thermometry instrument does not meet CE Mark requirements. Redesign the electronics and sensing head resulting in enhanced performance. I made significant improvements to the Users Manual and associated documentation. Passed CE Mark and increased European orders.

Institution of ISO-9001 quality system is bogged down, consulting agency growing impatient with progress. Assume role of quality manager and act as principle toward completion of ISO-9001. Granted ISO-9001 status in short time frame and soon have system running smoothly.

Support broad range of process control instruments; re-design products for cost reduction and CE Marking compliance. Determine cause and solution to design flaws in existing products, and then implement solutions through an ISO-9001 approved IRN / ECO process.

Developed closed loop magnet control circuit for +/-1.85T high field version of in-line Quasi Static tester. I am listed as a co-inventor on submitted patent application.

Design and build electrical wiring harness for MECA Sample Wheel / Translation Stage on Phoenix 2007 Mars Lander. Test reliability with extensive motion control script using OEM step motor controller.

**Employment History:**

Electronics Engineer, Integral Solutions Int'l, Santa Clara, CA	3 years
Electrical Design Engineer, FEI Company (Acquired Surface Interface, Inc.), Sunnyvale, CA	5 years
Sustaining Engineer, LUXTRON CORP. (DBA: LumaSense Technology), Santa Clara, CA	7 years

**Education:**

Computer Programming from DeAnza College: PSpice V9.2, VBasic, UNIX, OOP, C++, C, Scientific Pascal, and MASM with SJSU Programming, Math, and Physics transfer requirements completed. Associate in Arts from Cabrillo College