Robert M. Martin Jr.
Cell: (612) 817-5544 Email: pintorm@aol.com

**PROFILE**

Results-oriented professional with electronic component evaluation skills in the area of product development and extensive engineering design. Proven leadership and management skills gained in the area of facilities maintenance engineering and demonstrated success in design, troubleshooting and problem solving. Sales experience in the retail sector. **Six Sigma Green Belt Certification (2012)**

High Voltage High Frequency Power Supply Design
Electromagnetic (EM) Testing
Electrical Engineering Circuit Design
Matlab Programming
Requirements Writing and Management
VHDL Programming

**PROFESSIONAL EXPERIENCE**

DEPARTMENT of the NAVY
Naval Sea Systems Command (NAVSEA), Combat Direction System Activity (CDSA)
Naval Air Station Oceana - Dam Neck Annex - Virginia Beach, Virginia

**Electronics Engineer (ND-0855-03)** **May 2016 – Present**
**Supervisor: Bathsheba Nelson, (757) 492-1647**
**Sensor Distribution Systems Branch (R32), NSWCDD Dam Neck Activity**
Engineer for Surface Ship Radar Data Distribution System – System Operational Validation Test (SOVT) and Initial Light-On (ILS) test for ship Radar Data Distribution Systems, AN/SPA-25H project Engineer, Branch Risk Manager.

- Conducted SOVT on USS Milos Guided Missile Destroyer.
- Performed Requirements Verification System Stress Test (RVSST) on Radar Console Software Upgrade.
- Finite State Machine Matlab project to duplicate the processing of the three signals currently performed by an array of discrete components into a minimal chip set such as an FPGA, microcontroller , or microcomputer . The system also includes a video signal and that signal will be addressed after design of the synchro and ACP/ARP signal processor is approached. Developed a Matlab script that simulates the RADDS data stream. The previous simulation was a bread boarded hardware test board.
- Developed the algorithm for a sequential logic based Finite State Machine that model the inputs and outputs of the RADDS converter hardware and can be programmed into a component of the shelf (COTS) Field Programmable Gate Array (FPGA).
- Develop a draft Pros/Cons brief for the incorporation of Digital Video Distribution System (DiVDS) DIVDS w/SPQ-15(V). Developed a technical brief of the DIVDS for analysis for developing the draft Pros/Cons and I presented a draft Pros/Cons Document to the engineering group lead for review.
- Developed an In-house Laboratory Independent Research (ILIR) Proposal to investigate and characterize a new “Artificial Neural Network (ANN) Neuron Form” which is a proposed Spherical Neural Network (SNN) concept that will utilize the volume of the unit sphere and manipulate the boundary of the volume based on the inputs and the training data. This is contrasted with the more traditional Spherical Neural Network Matrix which creates self-organizing maps (SOM) and representative clusters of the data set on the surface of the unit sphere and does not alter the shape or volume of the sphere. The outer sphere is called the “universe” and the inner sphere is called the “form”. The two spheres are connected by a multitude of ANN “neurons”. The length of the connecting neuron corresponds to the weighting factor of the neuron. The “form” changes shape according to the weighted length of the attached neuron. The hypothesis that is presented and tested for this research is that a shape-shifting closed solid ANN provides performance over traditional SNN topologies due the ability to alter the dimensions of the form to a desired optimal output representation.
- Developed a Naval Surface Warfare Center Dahlgren Division (NSWCDD) Naval Innovative Science and Engineering (NISE) White Paper and Proposal. The objective is to replace the current contractor proprietary PMC Target extractor board, (PMC_TEB), with a Field Programmable Gate Array (FPGA)

component module for cost savings, and end of production life of the current product and reduces space and power consumption. The radar target extractor is an integral part of the RADDS system. Without this upgrade, the warfighter's mission readiness capabilities will be impeded. The current product cost is $18,245 in FY17 dollars adjusted from a FY13 cost of $16,211 with a 3% annual inflation rate. The current yearly usage rate is on average 15 units for a total material cost of $273,675 in FY17 dollars. FPGA development kit boards start at a single unit retail price of $100-$1000. Presented the project proposal to the NISE selection board at NSWC Dahlgren Division

**Naval Acquisition Development Program Intern** May 2014 – May 2016
**Supervisor: Richard Riggs, (757) 492-1647**
**R32 Data Distribution Systems Branch, NSWCDD/CDSA R32**
The Naval Acquisition Development Program (NADP) provides professional development to promote the growth of professionals in finance, contracting, logistics, science and engineering. This rotational program provides training for understanding the naval acquisition process in providing weapons, operations, and support systems.

- Attained Defense Acquisition Workforce Improvement Act (DAIWA) Level I Certification.
- Attained Defense Acquisition Workforce Improvement Act (DAIWA) Level II Certification.
- Prepared facility study and cost estimates for additional laboratory space.
- Prepared market research study of commercial wearable biometric products.
- Prepared comparison of Android reference design platforms for integration into wearable interface gear.
- Trained on JAVA and Android Development Platforms.
- Trained on assembly and troubleshooting of Naval RADAR display console SPA/25H.
- Develop RADDS Converter algorithm in VHDL programming code to adapt to a finite state machine structure. The RADDS data stream is 64 bits long and I translated to 130 unique states to identify for a synchro/resolver input, a ACP/ARP input or a direct RADDS input. Developed state diagram that can that can be used in a Finite State Machine editor in an FPGA development Board software suite. Development initial component design for RADDS converter retrofit board.
- Submitted a change control document to initiate used of FPGA development kits to be connected to the TSSN network, currently USB connected peripheral device need DIO approvals before use in connection with the TSSN network.

**NORTH CAROLINA AGRICULTURAL & TECHNICAL STATE UNIVERSITY 2012 – 2014**
**Greensboro, North Carolina**
**Graduate Student**
**Doctorate Program Coursework – Electrical Engineering**
**Advisor: Gary L. Lebby, PhD Research Professor**
Went back to graduate school to pursue life-long goal.

- Coursework in Control Theory, Artificial Neural Networks, Digital System and Digital Signal Processing and Power systems

**Multi-Tech Systems, Inc.** **Mounds View, MN**
**Electrical Component Engineer –Quality Control** **December 2005 - April 2009**
Responsible for identifying, documenting and qualifying components that supported product design and Restrictions on Hazardous Substances (RoHS) part compliance. Completed over 100 component approval documents for electronic components (resistors, capacitors, inductors, flash memory, logic gates, etc.) and two design reviews on MODEM products to outline the non-RoHS compliant components and made a list of RoHS compliant components to be revised in the Bill of Materials (BOM) and developed a testing routine that involved a statistical sampling of memory IC's in product production runs. Reviewed and created Engineering Change Orders (ECO's) in order to support release of or updates to components. Created Failure Modes Effects Analyses (FMEA). Reversed engineered a potential customer product and develop a bill and cost of materials and possible component substitutions.

- Created and maintained approved vendor lists (AVL) and flowcharted component approval process as an analysis tool and developed preliminary component approval prioritization spreadsheet for incoming parts and utilization of department resources (man-hours, testing time, etc.).

- Interacted with customers, design agencies, suppliers, and internal organizations to qualify components and ensured the reliability of MODEM products, and to assist in resolving design, development, production, and acceptance issues.
- Designed and conducted radiated and conductive electromagnetic emissions testing on end user products.
- Developed test procedures and performed routine to moderately complex engineering evaluation tests, product and process capability studies, quality audits, product or project data reviews, and other engineering evaluation work to assure reliable component delivery and quality.
- Manufacturing, design, and quality control were centrally located which made an ease of communication. Could simply walk to the manufacturing line and when in times of short delivery times, assisted on the line in packaging product. Researched and verified temperature profiles of components for the wave solder process. This gave me the opportunity to work with the production line first hand, especially with the conversion from leaded to lead free assembly processes. For example, I learned that the wave solder temperature profile for lead free components is approximately 20º C higher than leaded components.
- Trained on the Gigahertz Transverse Electromagnetic cell (GTEM) cell for Electromagnetic (EM) immunity testing, the Niton 797 Series Alloy Scanner to inspect incoming components for prohibited materials (Lead, Cadmium, Bromides, etc.) and the Schaffner System 2050 for electrical surge and transient field test.

**3M Company Maplewood, MN** **April 1996 - July 2001**
**Advanced Product Development Engineer**

Facilitated developments for electrical components in Positive Air Purifying Respirators. Incorporated developments of electrical components that will improve current products. Tested the reliability of electrical components for existing and new products. Responded to customer use requirements and questions for respirator products.

- Led project for airflow blower unit addressing customer concerns of perceived lowered airflow. Coordinated mechanical design and process engineering, conducted quality assurance testing, and coordinated schedule with marketing, packaging and technical service team members. Projected a $400,000 per year sales increase.
- Project manager and engineer for upgrade to a motor-blower unit for a helmet respirator product, I had to develop product requirements, prepare development schedules, organize project team members and coordinate mechanical design and process engineering tasks that resulted in an increase of purified airflow to the user.
- Project manager for the upgrade of an anti-fogging and scratch resistant coating for the visor for a helmet respirator product. The result was that the user's field of vision was improved during mining operations.
- Designed battery chargers to match recommended charging rates. Developed specifications for custom battery chargers for battery charger manufacturers. Determined charging rates, charging current cutoff schemes (time, temperature and voltage) for battery packs.
- Conducted life cycle testing and analysis on motors for existing and new products. Developed test methods and test procedures on sample size from motor production lot and operated samples until failure. Conducted analysis to determine if failure point supported manufacturer's claims.
- Negotiated with manufacturer a price reduction for the existing motor from $36 to $29 per unit resulting in a cost saving of about $180,000 over two years.
- Implemented a "3M 15% Time" project concept for a lower cost electric motor and simple assembly with 3M filter media for a low cost retail respirator system. The initial concept and prototypes resulted in nomination for the 3M Technical Circle of Excellence in the "Excellence in Technical Championing" category. Proposed new product applications such as the design of a current limiting circuit for a new product battery packs.
- Managed division guidelines through the product commercialization process to ensure that the project conformed to quality assurance and design criteria. Attended courses and workshops on small project management.

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- Experienced in agency compliance and approval requirements, expert in the Underwriters Laboratory regulation for Intrinsically Safe Apparatus, the UL 913. . Established guidelines for designing electrical components for respiratory products to meet Underwriters Laboratory's Intrinsic Safety guidelines. Redesigned a battery pack that was part of the product line of an Industrial Health and Safety business that was acquired by 3M company. The project involved redesigning the battery case and the internal wiring so that the product will conform to the UL 913 requirements and the Mine Safety and Health Administration Intrinsic Safety regulations.
- The European Community Standard EN 50020 also references the UL 913 specification. Incorporated the agency approval requirements into the design, manufacturing and maintenance of the respirator product line. One of the two engineers responsible for the design of a battery pack and motor unit to meet the EN 50020 intrinsically safe requirement. The project involved designing the battery pack with the correct over current and spark protection and the correct case design for use in potentially explosive atmospheres. The motor unit for the personal respirator unit had to be design to meet the over current and spark resistance for intrinsically safe conditions.
- Verified that the respirator products that were to be sold in Australia and New Zealand conformed to the Australia New Zealand Intrinsic Safety standards. The verification involved reviewing the standards, preparing and submitting the proper documentation, and taken the proper corrective actions as needed.
- Worked with the manufacturing operation concerning the intrinsic safety aspects of the product line. Advised the plant quality mangers on the proper documentation and certification for the respective agency approvals. Prepared the required corrective action documentation and updates to records when the agency inspection or when a recommendation was made by the approval agency noting a discrepancy.
- Worked with vendors on components such as motors, batteries, passive and IC components both domestic and international i.e. Maxon motor, Energizer Batteries, and Saft America.
- Developed specifications for electric motor and battery pack characteristics for company procurement agents to advertise for competitive bids. Designed test procedures and test equipment to model the performance characteristics of approximately 5 to 10 watts electric motors. Designed accelerated life testing criteria for electric motors and battery packs.
- Designed battery packs for powered air purifying respirators based on customer input for airflow requirements and discharge cycle duration and incorporating the correct safety circuitry to meet Underwriters' Laboratory, Canadian Standard Association and European Union intrinsic safety standards.
- Developed circuit designs and performed quality assurance testing for power supplies (DC/DC converters, Battery chargers, and battery management modules) for existing and new respirator products.
- Determined the speed and torque characteristics for electric motors used in centrifugal fan units used in the blower units for a powered air purifying respirators. Developed speed and torque curves for three existing products and two new products.
- Prototyped sensor circuitry that measured airflow, determined battery discharge cycle time and low battery pack voltage and proposed new product applications such as designing a current limiting circuit for a new product battery pack.
- Worked with the international market and went to London, England for a week to work with European colleagues on the next generation respirator. Meet with the European vendors to the division and developed the product specification for the electric motor and battery pack requirements. Developed a respirator battery pack based on Nickel Metal-Hydride chemistry instead of the Nickel Cadmium chemistry that, at the time, was used in the existing product line. The design of the product line had to incorporate the need to meet the mandate for the eventual cease of use of cadmium in all electrical and electronic components in the European Union. The Nickel Metal hydride pack was incorporated into a respirator product used in the European market.
- Required to perform design reviews on the electrical designs for the powered air purifying respirator product line. Responsibilities were ensuring the product design conformed to the requirements of the company's product commercialization system, adhered to the requirement for the product to meet government regulations for industrial respiratory protection equipment, and meet all of the customers' needs.

- Worked certification process for a Lithium Manganese Battery Pack with a contracted testing laboratory to meet the requirements of the United Nations mandates for international hazardous material and cargo transportation. Required to become an expert in the regulation and perform the internal testing and oversee the external testing required. The battery pack used by the US military forces was approved for the necessary cargo transit requirements.

**Metropolitan Sports Facilities Commission; Hubert H. Humphrey Metrodome; Minneapolis Minnesota; (Jan. 1996 – Mar. 1996)**
**Team Engineer I**
Coordinated and managed activities of contractors for building maintenance projects and provided engineering assistance to the maintenance team as needed.

**Florida A&M University Tallahassee, FL (August 1992 – May 1995)**
**Research Associate and Adjunct Professor**
Instructor for Mechanical Statics, Engineering Economic Analysis, and Microwave Technology courses. Research Associate at Florida Agricultural and Mechanical University (FAMU), designed mathematical models for transit systems and taught engineering technology courses.

- Co-authored paper and book titled "Urban Transportation Model Evaluation for Small to Medium Size Transit Systems". The book covered research on transportation ridership satisfaction models and data assessment. The task included candidate model assessment, candidate model review, data collection and assessment, and research conclusions and recommendations. The review resulted in the collection of 295 abstracts, 38 reference articles and 8 survey instruments.
- Presented paper on behave of the FAMU National Urban Transit Institute at a transportation symposium in Tampa, FL.

**United States Air Force; Moody Air Force Base, Georgia; Civil Engineering Squadron; Commissioned Officer (Captain); (Oct. 1987 - Aug. 1992)**
**Deputy Chief, Air Base Operability Flight**
Organized, trained, and equipped mobile engineering force to support Air Force directives and directed Disaster Preparedness Section to support contingency operations.
**Chief, Readiness Section**
Prepared 150 person Air Force Engineering Unit and wartime facility maintenance functions. Prepared mobile engineering force to support Air Force directives and contingency operations. Managed War Reserve Combat Material Program and cited as "One of the Best Managed on the Base". Developed and directed training program for unit.
**Contract Programmer and Design Engineer** (1987-1990)
Developed programming documents for evaluation of construction projects, conducted environmental and economic impact studies for base construction projects and provided electrical and facility design for projects and design support to project engineers.

- Contract Programming Documents - Addition to Telecommunications Facility, Bury Communications Cable, Addition to Family Support Center, Construct Running Track, Construct Driving Range on Golf Course, Construct K-Span Facility, Construct Family Camping Facility, Construct Fitness Center Addition, Construct Basketball Court for Youth Center, Construct Housing Maintenance Facility, Construct Cabins at Recreation Area.
- Facility Siting Documents - Construct Engine Testing Facility Office, Dormitory Storage Facility. Commissary Personnel Picnic Pavilion, Hospital Bio-Waste Facility

- Engineering Design Projects

  - Project manager for the design of the addition to the base telecommunication facility for the housing of a $2.5 million base telephone switching system. Provided quality control for specifications and drawings at the 60% and 90% design stages, incorporated user requirements to architect. Provided facility for switching equipment that greatly improved the base telephone system. (estimated cost: $220,000).

- Supervised the survey to update the electrical one-line drawings for the electrical distribution system for Moody AFB, GA. Project included conducting field surveys of the installation, and coordinating updates with exterior electricians and drafting personnel. The updated one-line drawing played a vital part to expedient recovery from damage from several subsequent severe weather incidents.
- Designed the electrical requirements for the installation of HVAC units for the Visiting Officer Quarters and the Temporary Lodging Facility. Supported requirements to lower the energy consumption of the facilities and improved the quality of life for transient personnel (estimated cost: $200,000)
- Provided electrical design support on project to install a bottom-loading fuel system to the base service station. (estimated cost: $17,000)
- Designed project to install insulation in Wing Commander's quarters. Reduced the energy requirement for temperature control for a forty-year-old facility and improved quarters for base senior officer. (estimated cost: $8,000)
- Conducted an electrical evaluation of the electrical work required for the relocation of computer equipment to Bldg. 905 of the base medical complex. Designed project for subsequent relocation. Action supported the consolidation of the base hospital computer operations. (estimated cost: $17,000)
- Designed electrical and lighting system for major renovation to Consolidated Base Personnel Office building. Project included new lighting and electrical rewiring. Designed for increase in electrical load requirements and maintained existing panel boards to produce more energy efficient design. (estimated cost: $100,000)
- Developed statement of work for repair of automatic doors in Aircraft Maintenance Unit. Solved a repair problem that impaired unit efficiency by restricting access to the flight line. (estimated cost: $1,000)

**EDUCATION**

Doctor of Philosophy – Electrical Engineering (2012-2014)
North Carolina A&T State University, Greensboro, NC

Master of Business Administration, Finance and Entrepreneurship Concentrations, 2001
Carlson School of Management, Univ. of Minnesota, Minneapolis, MN

Finance concentration courses covered topics such as adjusted present value, economic value added, the term structure of interest rates, the impact of financing decisions on real asset valuation, theory and practice of efficiently managing working capital and fixed assets, and portfolio performance evaluation.

Master of Science in Electrical Engineering, 1994
Florida Agricultural and Mechanical Univ., Tallahassee, FL
Electromagnetic Concentration

Bachelor of Science in Electrical Engineering, 1986
North Carolina Agricultural and Technical State Univ., Greensboro, NC

Engineer-in-Training, certificate number 16326, in the state of Georgia

Air Force Institute of Technology, School of Civil Engineering and Services, Wright-Patterson AFB, Ohio. Facility Systems Design, TEMPEST/HEMP Shielding Design, Electrical Power Systems Design, Introduction to Base Civil Engineering, and Construction Cost Estimating.

**CERTIFICATIONS and CLEARANCES**

Six Sigma Green Belt Certification (December 2012)

Current SECRET clearance DOD - Navy effective 06/01/2015