

**Jonathan R. Wood, Ph.D.**

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**SUMMARY**

Dr Wood has a Ph.D from M.I.T. and 51 years of career experience in analog circuits, power electronics, power supplies, feedback control systems, and electromechanical systems. He has an intimate knowledge of the skills of practicing engineers, based in part on 30 years of experience running his own business in power electronics. He has an extensive list of technical publications, and has given lectures on feedback systems and power electronics at major universities and at power electronics conferences. Dr Wood is a Life Member of the I.E.E.E. He holds sixteen patents in the field of electronic power conversion, and has served as an expert witness in over a dozen cases, including trial experience and numerous depositions.

**EXPERTISE**

- Power Electronics
- Power Conversion
- Power Supplies
- Power Supply Design
- Power Management
- Analog Circuits
- Analog Electronics
- Electrical Engineering
- DC-DC Converter Design
- Magnetics
- Expert Witness

**EDUCATION**

**Ph.D.** Electrical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1973.

**M.E.** (Master of Engineering, Electrical), The University of Auckland, New Zealand, 1969.

**B.E.** (Bachelor of Engineering, Electrical), The University of Auckland, New Zealand, 1968.

**EXPERIENCE**

**Altor Limited LC**, Concord, Massachusetts, [www.jonathanrwood.com](http://www.jonathanrwood.com)

**President**, October 2004 to present. Consulting and Expert Witness services in analog and power electronics. Clients include:

Andrews Kurth LLP, Washington DC  
Argo-Tech Corporation, Cleveland OH  
Baker and McKenzie LLP, Dallas TX  
Chubb Insurance Company, Boston MA

Cooley Godward LLP, San Francisco CA  
Covington and Burling LLP, Redwood Shores CA  
Design Concepts, Inc., Madison WI  
Dell, Inc., Round Rock TX  
EMO Labs, Inc., Waltham MA  
Fairchild Semiconductor Corporation, Portland ME  
Haynes and Boone LLP, San Jose CA  
Heller Ehrman LLP, San Diego CA  
International Rectifier Corporation, Leominster MA  
ITT Night Vision, Roanoke VA  
Johnson Outdoors Marine Electronics, Mankato MN  
Lincoln Electric Company, Cleveland OH  
MagneMotion, Inc., Devens MA  
McDermott, Will and Emery, Chicago IL  
Meisterling and Associates LLC, East Hampton CT  
Microtech Systems Inc., Foster City CA  
Miles & Stockbridge PC, Tysons Corner VA  
Milwaukee Electric Tool Corporation, Brookfield WI  
Monolithic Power Systems Inc., San Jose CA  
Morgan, Lewis & Bockius LLP, Chicago IL  
Norbar USA, Inc., Willoughby, OH  
O'Melveny and Myers LLP, Los Angeles CA  
ON Semiconductor, East Greenwich RI  
Orrick, Herrington & Sutcliffe LLP, Menlo Park CA  
PL Manufacturing Inc., Cooperstown ND  
Primary Insight, Inc. (Division of Bear Stearns) New York NY  
Qualcomm Inc., San Diego CA  
Rackspace Hosting, San Antonio TX  
Resonance Research, Inc., Billerica MA  
R. F. Little Engineering, Windham NH  
Ropes & Gray, New York NY  
Sager and Schaffer LLP, Westborough MA  
SkyNet Electronic Company, Taipei Taiwan ROC  
Smith Amundsen LLC, Indianapolis IN  
TAEUS International Corporation, Colorado Springs CO  
Unifi Scientific Advances, Longview TX  
uPI Semiconductor Corporation, Taiwan ROC  
Vista Research (Div. of McGraw-Hill), New York NY  
Watts Regulator Company, North Andover MA  
William Drake Ltd., Buckfastleigh, Devon UK  
Winston & Strawn LLP, New York NY  
Williams & Connolly LLP, Washington DC

**Acumentrics Corporation**, Westwood, Massachusetts, [www.acumentrics.com](http://www.acumentrics.com)

**Vice President of Engineering** October 1999 to October 2004. Acumentrics designs and manufactures solid-oxide fuel cell systems and ruggedized uninterruptible power supplies for distributed power applications. As a partner in the firm, Dr. Wood served for seven years as Vice President of Engineering and a Member of the Board of Directors.

Dr. Wood oversaw the integration of two engineering teams from merging companies into a cohesive, unified, and productive group with three major development activities: Rugged UPSs, Flywheel-based UPSs, and Fuel Cell Systems. He identified and hired key personnel to ensure the success of each program. He set up and directed an overseas operation, from the US. He also

supervised and participated in a successful 200 kW flywheel system development, incorporating programmable hand-held controllers.

**Altor, Inc.**, Natick, Massachusetts

**President** December 1986 to October 1999. Altor, Inc. designed and manufactured custom power conversion products. Dr. Wood founded Altor, Inc. in 1986. Without funding he grew it to a successful 15-person organization serving a wide variety of customers and applications. Altor, Inc. merged with Acumentrics Corporation in October 1999. Altor, Inc. provided analysis, design, prototyping, and manufacturing services to a wide variety of customers, including, but not limited to:

Agile Networks, Inc., Concord MA  
AirNet Communications Corporation, Melbourne FL  
Applied Laser Electronics, Ashland MA  
Alliant Computer Systems, Littleton MA  
AMP, Inc., Harrisburg PA  
AT&T Corporation, Whippany NJ  
Avid Technology Inc., Tewksbury MA  
Avidyne Corporation, Lexington MA  
Barkley and Dexter, Fitchburg MA  
Beacon Power Corporation, Woburn MA  
Bose Corporation, Framingham MA  
Broadband Access Systems, Inc., Marlborough MA  
Bytex Corporation, Southborough MA  
Cherry Semiconductor Corporation, East Greenwich RI  
Compaq Computer Corporation, Maynard MA  
Cooper Energy Services, Mount Vernon OH  
Coral Network Corporation, Marlborough MA  
Data General Corporation, Westboro MA  
Digital Equipment Corporation, Maynard MA  
Digital Marine Electronics Corporation, Acton MA  
EMC Corporation, Hopkinton MA  
Epoch Systems Inc., Marlborough MA  
E-Systems, Greenville TX  
Fletcher Challenge Corporation, Auckland, NZ  
FORE Systems, Inc., Warrendale PA  
The Foxboro Company, Foxboro MA  
GTE Government Systems, Needham MA  
IDE Corporation, Billerica MA  
International Power Devices, Brighton MA  
Lancast, Inc., Nashua NH  
Lockheed Sanders Corporation, Nashua NH  
LTX Corporation, Westwood MA  
Lucent Technologies, Inc., Marlborough MA  
Lucent Technologies, Inc., Mt. Olive, NJ  
MacConnell Research, San Diego CA  
McLaughlin Research Corporation, Middletown RI  
Microcom Inc., Norwood MA  
MITEQ Inc., Hauppauge NY  
The MITRE Corporation, Bedford MA  
MP Video Inc., Hopkinton MA  
Northstar Marine, Acton MA  
Nuclear Logistics Inc., Fort Worth TX  
PB Diagnostic Systems Inc., Westwood MA

PictureTel Corporation, Peabody MA  
PowerCube Corporation, Chatsworth CA  
Prominet Corporation, Marlborough MA  
Racal Interlan Inc., Boxborough MA  
Raytheon Company, Lexington MA  
Sensormatic Electronics Corporation, Deerfield Beach, FL  
Sepracor Inc., Marlborough MA  
Serco Systems Limited, Portsmouth, England  
Simplex Time Recorder Company, Gardner MA  
Smith and Nephew Dyonics, Inc., Andover MA  
Steinbrecher Corporation, Burlington MA  
SurgiQuip, Inc., Tulsa OK  
Technical Communications Corporation, Concord MA  
Tellabs, Inc., Burlington MA  
Thermal Dynamics Inc., West Lebanon NH  
Venable Industries, Torrance CA  
Wang Laboratories, Inc.  
Willett International Limited, Framingham MA  
Xylogics Inc., Wilmington MA  
Xyplex, Inc., Littleton MA  
Yamato Lock, Inc., Fitchburg MA  
Zero Emissions Technology Inc., New Durham NH

Altor designed and manufactured power supplies for numerous applications, including, but not limited to:

- Instrumentation power supplies
- Medical power supplies
- Programmable linear power supplies
- Specialty power supplies
- Computer power supplies
- Telecommunication power supplies
- Rugged environment power supplies
- Dual-redundant power supplies
- Multiple-redundant power supplies
- Industrial power supplies
- Replacement power supplies

Growth of the company was based on profits alone. Research was carried out on supporting technologies for high-speed motor-generators for use in premium power supply applications. Dr. Wood gained a wide-ranging US Patent in this area. He also gained a US Patent on a feedback control circuit for use with industry-standard converter modules.

**Data General Corporation**, Westborough, Massachusetts

**Senior Engineer** 1981 to December 1986. Dr. Wood served in both management and technology-leadership roles, with a primary focus in computer power supplies.

Designed a reliable and economical power supply for the corporation's MV/4000 computer, a major revenue-producing product for the corporation. Obtained a US Patent on one aspect of this design.

Carried out successful modeling, analysis, and design implementation of democratic load-sharing schemes for modular power supplies.

Categorized, modeled, and compared options for power supply front ends for fault-tolerant systems. Developed computer simulations for some of these.

Identified, modeled, and implemented a fast-transient-response feedback loop design method. Presented technical papers at national power conversion conferences in 1982 and 1983.

Identified, modeled, and explained the occurrence of chaotic system behavior in switching power supplies. Presented a pioneering technical paper at a power conversion conference in 1984.

Investigated the use of high-speed motor-generators for robust power supply front ends featuring long ride-through and complete immunity to power line transients. Designed, simulated, built, and successfully tested a 1 kW system and a 3 kW system.

#### **Mobil Tyco Solar Energy Corporation**, Waltham, Massachusetts

**Group Leader**, Systems Engineering, 1977 to 1981. Managed the development and installation of photovoltaic-powered systems.

Designed, built, and tested novel solar photovoltaic concentrating collectors, including Winston collectors, planar-concentrating collectors (employing fluorescent dyes), and modified fresnel-lens collectors. Evaluated the economics of each type.

Identified and simulated a practical algorithm for maintaining battery charge in a photovoltaic-powered water processing system. Supervised the design, building, and test of a 1 kW photovoltaic system to test this.

Wrote successful proposals for demonstration photovoltaic-powered water desalination systems.

Supervised the design and building of an 8 kW photovoltaic-powered water desalination system. This system produced potable water from sea water, and was installed and operated near Jeddah in Saudi Arabia.

#### **Energy Consultant**, 1974 to 1977.

Working for the New Zealand Government, carried out an extensive study of wind power potential for New Zealand. Identified and applied an algorithm for measuring the economic benefit to a utility grid of an intermittent energy source. Used hourly records of wind occurrence at selected sites, together with hourly records of electricity demand for the utility grid, as a data base for a computer-based assessment of correlation between supply and demand. Visited wind power hardware manufacturers in the US, Canada, Britain, Switzerland, and Holland.

Assisted with the design, construction, and testing of a 30 kW Darrieus wind turbine.

Working for the New Zealand Government, participated in the development of 50-year energy scenarios for New Zealand. Studied all factors affecting growth in energy demand, and all conceivable sources of energy production. Developed four distinct scenarios, all based on meticulous calculations. Published two extensive reports.

#### **University of Auckland**, 1976 to 1977.

Senior Lecturer in Electrical Engineering, University of Auckland, New Zealand. Taught Basic Electronics, Power Electronics, and Control Theory. Research included the development of electronic power converters for 1 – 20 kW wind turbines.

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