

CURRICULUM VITAE

Michael E. Gruchalla

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Education:

MSEE, 1980, University of New Mexico,
Albuquerque, New Mexico.

BSEE, 1968, University of Houston,
Houston, Texas.

Training and Professional Experience:

Subject-Matter Expert and Principal Engineer, Fiore Industries
Albuquerque, New Mexico, November, 2022 – (Retired).

Subject-Matter Expert and Principal Engineer, EG&G/URS,
Albuquerque, New Mexico, March, 2008 – September, 2017.

Principal Engineer and Electrical Authority Having Jurisdiction (“EAHJ”),
Honeywell FM&T/NM, Albuquerque, New Mexico, March, 2005 –
March, 2008.

Senior Staff Engineer, Honeywell FM&T/NM (Previously AlliedSignal)
Albuquerque, New Mexico, October, 1994 – March, 2008.

Engineering Specialist, EG&G EM, Inc.
Albuquerque, New Mexico, 1987 - 1994.

Project Manager/Group Leader, EG&G WASC, Inc.
Albuquerque, New Mexico, 1974 - 1987.

Captain/Electrical Engineer,
United States Air Force, 1968 - 1974.

Professional Certifications:

Licensed Professional Engineer, State of Texas.

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AWARDS and RECOGNITIONS

1. Engaged March 2024 by the MQN Collaboration International Consortium to design and fabricate custom electronic systems for advanced research for means to isolate and capture Magnetized Quark Nuggets ["MQN"]. MQN is a form of Dark Matter, and theoretically if MQN can be isolated and captured, this form of matter could have very significant value in both scientific research and commercial applications including clean energy generation.
2. Commissioned January 2023 by the Science Advisor to Los Alamos National Laboratory and a White House Fellow to develop designs of experiments and to construct physical experiments to determine the feasibility of specific electronic countermeasures ("ECM"), and to test the efficacy for interdiction of the areal weapons being utilized against Ukraine.
3. Awarded Small Business Innovation Research ("SBIR") award as Principal Engineer ("PE"), Subject-Matter Expert ("SME") and Principal Investigator ("PI") for SBIR Phase-I engineering research study, September, 2017 – September, 2018, to determine feasibility of development of high-power (>10 kW), extremely wide-bandwidth (>18 octaves) RF power amplifiers to be applied in critical commercial and military venues to assess and verify vulnerabilities of critical systems to high levels of electromagnetic radiation, and to verify compliance of systems to meet National Standards implemented to assure survivability and uninterrupted operation of critical systems to high levels of electromagnetic pulse ("EMP"), high levels of electromagnetic radiation, and high levels of electromagnetic interference ("EMI"). Note: The content of this work, papers and associated presentations may be classified as sensitive National Security Information and may comprise matter that is controlled under the Arms Export Control Act ("AECA"), controlled under International Traffic in Arms Regulations ("ITAR"), and may also be controlled as UCNI, and therefore information may be limited to cognizant government agencies and cleared individuals having formally-authorized Need to Know basis.
4. Selected as Principal Engineer ("PE"), Subject-Matter Expert ("SME") and Principal Investigator ("PI") for engineering research study, USAF, March, 2015 – October, 2016, to determine feasibility of development of high-power (>1 kW), extremely wide-bandwidth (>18 octaves), balanced 50-Ohm to 200-Ohm RF transformer to be applied in critical commercial and military venues to assess and verify vulnerabilities of critical systems to high levels of electromagnetic radiation, to verify compliance of systems to meet National Standards implemented to assure survivability and uninterrupted operation of critical systems to high levels of electromagnetic pulse ("EMP"), high levels of electromagnetic radiation, and high levels of electromagnetic interference ("EMI"). Note: The content of this paper and associated presentations may be classified as sensitive National Security Information and may comprise matter that is controlled under the Arms Export Control Act ("AECA"), controlled under International Traffic in Arms Regulations ("ITAR"), and may also be controlled as UCNI, and therefore publication may be limited to cognizant government agencies and individuals having formally-authorized Need to Know basis.
5. Personal invitation from Bill Gates and Paul Allen of Microsoft to attend the Microsoft MITS 40th Anniversary Reunion, June 12-14, 2015, Seattle, Washington, USA, for all the individuals who at MITS contributed to the development of the Altair 8800 and the early success of Microsoft. Mr. Gruchalla designed the power-supply systems for the first MITS

Altair 8800 productions. The Altair 8800 has been recognized by many as the first personal computer, and those who contributed to its development recognized as the founders of the worldwide personal-computer industry.

6. Elevated to IEEE Life Senior Member, January, 2013. Commendation: “IEEE Life Senior Membership is reserved for those who have been part of the IEEE community for a sustained period of time. Earning this status recognizes your achievements in technology, as well as the significant impact you have had on the growth and development of IEEE. ... IEEE Life Senior Members are among the most active and engaged volunteers. They serve as reviewers, editors, and conference organizers. They participate in development of standards, organize and participate in local meetings, and serve in leadership roles at all levels of the organization. ... We are grateful for your loyalty.”
7. Recipient of Defense Programs 2011 Award of Excellence “For Significant Contributions to the Stockpile Stewardship Program,” Donald L. Cook, NNSA Deputy Administrator for Defense Programs.
8. Recipient of URS Award of Excellence, January 2011, presented by John Bozarth, URS Vice President Engineering Life Cycle Services, “For your Technical Excellence and Outstanding Customer Support to the Stockpile Steward program. Your willingness to undertake the most difficult tasks, your exceptional leadership, and your expertise have been recognized by URS.”
9. Recipient of 2009 award of recognition for “HiFES Panel 8 Subsystem “For outstanding dedication and technical excellence in the delivery of the Panel 8 Subsystem for the HiFES satellite program,” Jerry L. McDowell, Sandia Vice president, Defense Systems and Assessments.
10. Recipient of the Honeywell Significant Technical Achievement Reward and Recognition Award (Honeywell FM&T “STARR” Award), 2006, for novel design and implementation of a compact, high-performance, very high-efficiency, radiation-tolerant poly-phase motor-drive system for critical satellite pointing and tracking applications.
11. Recipient of the Honeywell Significant Technical Achievement Reward and Recognition Award (Honeywell FM&T “STARR” Award), 2005, for novel design and implementation of a Particle Detection Test System comprising a very novel sensor design for validation of the performance of critical nuclear weapon components.
12. Personally invited to testify before the House Science Committee 107th Congress, First Session, 2001 to express my opinions relating how to improve National Competitiveness and Innovation.
13. Recipient of the Honeywell Significant Technical Achievement Reward and Recognition Award (Honeywell FM&T “STARR” Award), 2000, for novel design of a high-performance sensor and sensor interface electronics for very low-noise, very wide dynamic-range measurement of beam profile and beam halo in charged-particle-beam linear accelerators.

14. Personally Invited November, 1999 by Larry Bossidy, CEO AlliedSignal, to be part of the Team assembled to review design and durability issues in the development and production of the Parallon 75 product being developed at AlliedSignal Power Systems. The Parallon 75 product is a gas-powered TurboGenerator. According to Chuck Schmitt of AlliedSignal Power Systems, the Parallon 75 is the highest visibility project in AlliedSignal where "Each single Parallon 75 power system is designed to produce a steady dependable 75kW of power and, ultimately, multiple systems ganged together will be able to deliver more than 350 kW of power. "Our branding emphasizes the products' designed ability to operate parallel to the grid or as an independent second source of power, providing lower cost and more reliable electricity," said Tony Prophet, president and CEO of AlliedSignal Power Systems. The Team was assembled with recognized Subject-Matter Experts from across the business of AlliedSignal. The task of the Team was to review the designs and durability issues, and recommend corrective actions to solve the durability issues to successfully meet the delivery schedules for the Parallon 75 product line.
15. Created Lobo Internet Services, Ltd., Albuquerque, New Mexico, 1996 and serve as Vice-president 1996 to present.
16. Recipient of the 1994 EG&G General Manager's Vision Award for Community Involvement related to career-long service in educational outreach and community service.
17. Established the Albuquerque Chapter of the Electric Auto Association (EAA) and served as Vice President of the Albuquerque Chapter of the EAA, 1993 to 1999.
18. Invited to be on the 1993 Albuquerque Mayor's Clean Cities Committee to contribute information and technical expertise on developments in electric vehicles for both municipal vehicles as well as personal vehicles. Also engaged in general discussions of implementing light rail serving very select corridors, such as service from the Albuquerque International Sunport to the Downton area.
19. Invited to join the IEEE Intellectual Property Committee, 1992, working to protect intellectual-property rights of employed Artists and Inventors. Resigned my position on the IEEE Intellectual Property Committee 2002 on the direction of the law department of my employer Honeywell that participation on the Intellectual Property Committee was considered as a violation of the Honeywell Agreement Relating to Intellectual Property and Confidential Information, and could result in disciplinary action.
20. Received personal Letter of Commendation from Secretary James D. Watkins, Secretary of Energy, Department of Energy, October, 1991 for "Innovative, Dedicated Service to the Department of Energy and the Country."
21. Recipient of the 1991 Research and Development Magazine R&D-100 Research Award for research and novel developments in "Ultra-High-Performance Cathode-Ray Tube System."
22. Recipient of the Air Force Commendation Medal, 1973 for dedicated service as an officer and scientist/engineer in the United States Air Force.

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

1. Tau Beta Pi, Engineering Honor Society, Texas Epsilon Chapter.
2. Eta Kappa Nu, Engineering Honor Society, Epsilon Epsilon Chapter.
3. Institute of Electrical and Electronic Engineers, Senior Member.
4. Sigma Xi Scientific Research Society.
5. Instrument Society of America.
6. Editorial Review Board, Communications Technology, Inc., Ham Radio Magazine.
7. Advisory Board Working Group, Electronics Engineering Technology, Albuquerque Technological-Vocational Institute.
8. Editorial Review Board, CQ Communications, Inc., Communications Quarterly.
9. Institute of Electrical and Electronic Engineers Intellectual Property Committee.
10. Chair of the Honeywell KO Electrical Authority Having Jurisdiction charged with assuring electrical safety in all aspects of the work environment.
11. Listed in Marquis Who's Who In Science and Engineering.
12. Listed in Marquis Who's Who In The West.
13. Member of the Albuquerque Mayor's Clean Cities Committee.
14. Educational Outreach – Network with interested Albuquerque and tribal Native American high-school students to help them understand what engineering and other scientific careers involve.
15. Educational Outreach – Develop and present High-School Level instructional series teaching fundamentals of Personal Computer system hardware.
16. Albuquerque Career Enrichment Center – Acted as Project Supervisor the for Student Engineering Team for the design and construction of a Microgravity Experiment successfully fielded on the U.S. Space Shuttle Mission STS-85 on Space Shuttle Discovery:
17. Educational Outreach – Professional Mentor - Act as mentor to Albuquerque and Native American high-school students to promote math and science education and to bring the students into the professional environment in order to give them the opportunity to directly experience the engineering profession by performing actual engineering tasks. This has been a career-long activity.
18. Professional Mentor – Provide science and engineering guidance to colleagues and customers to aid in understanding of complex science and engineering issues to provide the individuals the ability and experience to develop effective, high-performance solutions to complex engineering and other scientific challenges.



19. Electric Auto Association – Established the Albuquerque Chapter of the Electric Auto Association (EAA) and served as Vice President of the Albuquerque Chapter of the EAA, 1993 to 1999.
20. Vice-president of Lobo Internet Services, Ltd., Albuquerque, New Mexico, 1996 to present.

PUBLICATIONS

1. Gruchalla, M. E., "Sample Time Integrator," Electrical Engineering Times, January, 1978.
2. Gruchalla, M. E., Optimized Preamplifier for Bismuth Position Detectors, University of Dayton, Dayton Ohio, 1979.
3. Gruchalla, M. E., "Measure Wide-Band Noise Using a Standard Oscilloscope," EDN, June, 1980.
4. Gruchalla, M. E., Dual Channel Fiber-Optic Trigger System, Masters Thesis, University of New Mexico, Albuquerque, New Mexico, 1980.
5. Gruchalla, M. E., Optimized Preamplifier for Bismuth Photo Detectors, International Laser Systems, Orlando, Florida, 1981.
6. Gruchalla, M. E., Optimized Preamplifier for InSb Photovoltaic Detectors, University of New Mexico, Albuquerque, New Mexico, 1981.
7. Motil, W., P. Johnson, G. Sower, A. Bonham, and M. Gruchalla, "The Cable Artery System - Design and Application in Aircraft EMP Testing," Alexandria: Conference on Instrumentation for Nuclear Weapons Effects, Naval Surface Weapons Center, Alexandria, Virginia, July, 1982.
8. Johnson, P., G. Sower, A. Bonham, M. Gruchalla, G. Kahn, and W. Motil, "Instrumentation Effects Upon EMP Induced Wire Current Responses in Aircraft," Alexandria: Conference on Instrumentation for Nuclear Weapons Effects, Naval Surface Weapons Center, Alexandria, Virginia, July, 1982.
9. Gruchalla, M. E., "Electrical Grounding in Large Instrumentation Systems," Proceedings of the 1982 EOS/ESD Symposium, Illinois Institute of Technology Research Institute, September, 1982.
10. Sower, G., A. Bonham, M. Gruchalla, and B. Pressley, "Instrumentation for EMP Measurements, Proceedings of the 1983 EMC Symposium, Zurich, Switzerland, March, 1983.
11. Gruchalla, M. E., "Practical Problems of Fiber Optics in Field Applications," Instrumentation in the Aerospace Industry, Vol. 29, Instrument Society of America, May, 1983.
12. Gruchalla, M. E., "Specifying Critical Components for Fiber-Optic Data Collection Systems," Industrial Technology, September, 1983.
13. Gruchalla, M. E., "Grounding in Instrumentation Systems," Measurements and Control, Issue 102, pp. 136-151, December, 1983.
14. Gruchalla, M. E., "Grounding in Instrumentation Systems," Medical Electronics, Issue 84, pp. 80-95, Co-released with Measurements and Control release, December, 1983.
15. Gruchalla, M. E., The Design of a High-Performance, Phase-Locked Motor Control System for Shuttered Video Applications, Miletus Associates, Albuquerque New Mexico, March, 1984.

16. Gruchalla, M. E., "Build Your Own Audio to Microwave Amplifier," Cover feature, Ham Radio, Vol. 17, No. 3, pp. 12-28, March, 1984.
17. Gruchalla, M. E., "A High-Speed, Log-Weighted Peak Level Recorder," Record of the 1984 NEM Symposium, July, 1984.
18. Gruchalla, M. E., "A Portable Programmable Pulser for Direct-Drive Testing," Record of the 1984 NEM Symposium, July, 1984.
19. Gruchalla, M. E., An Optimized Preamplifier System for a GeAu Photoconductive Optical Detector, Dynalectron, Inc., Albuquerque, New Mexico, July, 1984.
20. Gruchalla, M. E., "Build A Better Box," Ham Radio, Vol. 17, No. 8, pp. 45-48, August, 1984,
21. Gruchalla, M. E., "Defining The Decibel," Ham Radio, Vol. 18, No. 2, pp. 51-55, February, 1985,.
22. Gruchalla, M., A. Bonham, J. Gibson, and P. Johnson, "A Portable Programmable Pulser and High-Speed, Log-Weighted Peak-Level Recorder for Direct Drive Testing," Proceedings of the 1985 EMC Symposium, Zurich, Switzerland: March, 1985.
23. Gruchalla, M. E., The Design of a Portable Electroencephalographic Data Acquisition System, Miletus Associates, Albuquerque New Mexico, October, 1985.
24. Gruchalla, M. E., A. J. Bonham, and J. L. Gibson, "Performance of Linear Amplifier Systems in Direct-Drive Applications," Record of the 1986 NEM Symposium, May, 1986.
25. Gruchalla, M. E., and G. D. Sower, "Performance of Large Current Drivers," Record of the 1986 NEM Symposium, May, 1986.
26. Gruchalla, M. E., A. J. Bonham, and J. L. Gibson, "Automated Switching for Direct-Drive Pin-Drive Testing," Record of the 1986 NEM Symposium, May, 1986.
27. Gruchalla, M. E., "A Universal Analog Breadboard," Ham Radio, June, 1986.
28. Gruchalla, M. E., "NE5205 Wideband RF Amplifier," Ham Radio, September, 1986.
29. Gruchalla, M. E., "Power Distribution Safety in Instrumentation Systems," EMC Technology, Vol. 6, No. 1, pp. 17-34, January-February, 1987.
30. Gruchalla, M. E., "Fiber Optics - A Brief Introduction," Record of the Winter Meeting of the Western Regional Strain Gage Committee of the Society for Experimental Mechanics, Livermore, California, February, 1987.
31. Gruchalla, M. E., "Understanding Noise Figure," Ham Radio, Vol. 20, No. 4, pp. 89-95, April, 1987.
32. Gruchalla, M. E., "Automatic Multi-Pin Test Systems (AMPTS) For Direct Pin-Injection Testing," ITEM 1987, pp. 22-33, April 1987.

33. Gruchalla, M. E., "An Automated Multi-Pin Test System For Direct Pin-Drive Testing," Proceedings of the IEEE IMTC/87 Conference, pp. 171-177, April, 1987.
34. Gruchalla, M. E., "The Automatic Multi-Pin Test System For EMP Direct-Drive Testing," Proceedings of the ISA 33rd International Instrumentation Symposium, pp. 399-408, May, 1987.
35. Gruchalla, M. E., "Magnetic Current Drivers For Bulk-Injection Testing," Proceedings of the EMC Expo 87, San Diego, California, May, 1987.
36. Gruchalla, M. E., "An Automated Multi-Pin Test System For Direct Pin-Drive Testing," Invited paper (original copyright by the IEEE IMTC/87), Proceedings of the EMC Expo 87, San Diego, May, 1987.
37. Gruchalla, M. E., "An Automatic Multi-Pin Test System For Direct Pin-Drive Testing," Record of The Instrumentation for Nuclear Weapons Effects Conference (original copyright by the IEEE IMTC/87), Arlington, October, 1987.
38. Gruchalla, M. E., "Dynamic Range," ITEM 1988, pp. 87-98, April, 1988.
39. Gruchalla, M. E., "A Simple And Effective Procedure For Measurement Of Wide-Bandwidth Noise," ITEM 1989, pp. 272-288, April, 1989.
40. Gruchalla, M. E., "Magnetic Drivers For Bulk-Injection Testing," ITEM Update 1989, pp. 44-64, November, 1989.
41. Gruchalla, M. E., "Effective Noise Temperature, Part 1," Ham Radio, February, 1990, pp. 58-63.
42. Gruchalla, M. E., "Effective Noise Temperature, Part 2," Ham Radio, March, 1990, pp. 33-41.
43. Gruchalla, M. E., "Linear Amplifiers for Direct-Drive Testing," ITEM 1990, April, 1990, pp. 82-102.
44. Gruchalla, M. E. and G. D. Sower, "Meaningful Specifications for Magnetic Current Drivers," Record of the 1990 Nuclear EMP Meeting, May, 1990.
45. Gruchalla, M. E., "The Traveling-Wave Amplifier," Communications Quarterly, Spring Issue, Vol. 1 No. 2, pp. 95-100, 1991.
46. Gruchalla, M. E., "Fiber Optics," Communications Quarterly, Summer Issue, Vol. 1, No. 3, pp. 11-25 (cover feature), 1991.
47. Gruchalla, M. E., "Optimizing Amplifier Gain-Bandwidth Product," Communications Quarterly, Summer Issue, Vol. 1, No. 4, pp. 68-72, 1991.
48. Gruchalla, M. E., "Software - An American Industry At Risk?," Communications Quarterly, Winter Issue, Vol. 2, No. 1, 1992, pp. 99-105.
49. Gruchalla, M. E., "High-Frequency Bypass Capacitors," Communications Quarterly, Fall Issue, Vol. 3, No. 4, pp. 45-66, 1993.

50. Hagen, E. C., J. Champeny, M. E. Gruchalla, C. Hudson, S. Kocimski, W. Kuhlow, R. Mobley, N. Norris, M. Prokop, J. Spector, J. Thomas, "Ultra-High-Performance Cathode Ray Tube," Laser Tech Briefs, Spring Issue, 1994.
51. Gruchalla, M. E., "Using Inexpensive Digital Panel Meters," Communications Quarterly, Spring Issue, Vol. 6, No. 2, pp. 59-78, 1996.
52. Gruchalla, M. E., Invited Professional Testimony, United States House of Representatives Science Committee Hearing "Patent System and Modern Technology Needs: Meeting the Challenge of the 21st Century," House Science Committee, Subcommittee on Technology, Congressional Record, Washington, DC, June 6, 1996.
53. Gruchalla, M. E., "Complex Impedance Measurements," Communications Quarterly, Fall Issue, Vol. 8, No. 4, pp. 33-43, 1998.
54. Gruchalla, M. E., "Image Scanning – How Much Resolution is Enough?," Communications Quarterly, Summer Issue, Vol. 9, No. 3, pp. 9-24, 1999.
55. Gruchalla, M. E., "The Simple Diode RF Detector," Communications Quarterly, Cover Feature Article, Fall Issue, Vol. 9, No. 4, pp. 7-14, 1999.
56. Gruchalla, M. E., Engineering Report "Review of Design and Durability Issues in the AlliedSignal Parallon 75 Product, and Recommended Corrective Actions," AlliedSignal, Albuquerque, New Mexico, November, 1999.
57. Ander, Mark E., Tom Summers and Michael E. Gruchalla, "LaCoste & Romberg gravity meter: System analysis and instrumentation errors," Geophysics, November-December, Vol. 64, No. 6, pp. 1708-1719, 1999.
58. Gilpatrick, J. D., D. Barr, D. Bruhn, L. Day, J. Ledford, M. Peck, R. Shurter, M. Settler, R. Valdiviez, J. Kamperschroer, D. Martinez, J. O'Hara, M. Gruchalla, D. Madsen, "Beam Diagnostic Instrumentation for a 6.7-MeV Proton Beam Halo Experiment," XX International Linac Conference, Monterey, California, August, 2000.
59. Barr, D., L. Day, J. D. Gilpatrick, D. Kerstiens, M. Stettler, R. Valdiviez, M. Gruchalla, J. O'Hara, J. Kamperschroer, "Beam-Profile Instrumentation for Beam Halo Measurement: Overall Description, Operation, and Beam Data," 5th European Workshop on Diagnostics and Beam Instrumentation, Grenoble, France, May, 2001.
60. Barr, D., L. Day, J. Douglas Gilpatrick, Robert B. Shurter, Matthew Stettler, Robert Valdiviez, Derwin Martinez, Michael Gruchalla, James O'Hara, "Design and Experience with the WS/HS Assembly Movement Using LabVIEW VIs, National Instrument Motion Controllers, and Compumotor Electronic Drive Units and Motors," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
61. Sellyey, William, J. Douglas Gilpatrick, Michael E. Gruchalla, Pilar S. Marroquin, "Experience with Photomultiplier Based Beam Loss Monitors (PMBLM) at the Low Energy Demonstration Accelerator (LEDA)," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.

62. Gilpatrick, J., D. Barr, P. Colestock, L. Day, W. Sellyey, R. B. Shurter, M. Stettler, R. Valdiviez, J. Kamperschroer, M. Gruchalla, J. O'Hara, "Experience with the Low Energy Demonstration Accelerator (LEDA) Halo Experiment Beam Instrumentation," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
63. Gruchalla, Michael, Dean S. Barr, Lisa A. Day, Douglas Gilpatrick, Matthew W. Stettler, Derwin G. Martinez, James F. O'Hara, "Beam Profile Wire-Scanner/Halo-Scraper Sensor Analog Interface Electronics," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
64. Day, L. A., D. Barr, J. D. Gilpatrick, D. M. Kerstiens, M. W. Stettler, J. Kamperschroer, M. E. Gruchalla, J. F. O'Hara, "Automated Control and Real-Time Data processing for Wire Scanner/Halo Scraper Measurements," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
65. Gilpatrick, J., D. Barr, L. Day, M. Stettler, R. Valdiviez, J. Kamperschroer, D. Martinez, M. Gruchalla, J. O'Hara, "Beam-Profile Instrumentation for Beam-Halo Measurement: Overall Description and Operation," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
66. Gruchalla, Michael E., "Meeting United States Energy Demands – A Brief Review of the Magnitude of the Challenge," Invited Paper, Albuquerque IEEE Section, Albuquerque, New Mexico, 2006.
67. Gruchalla, Michael E., "The Accelerating Universe – An Alternate Heuristic Thesis," Unpublished Paper in Progress, 1980 – 2008.
68. Gruchalla, Michael E., P. Chacon, D. Gilpatrick, D. Martinez, "LANSCE Wire Scanner AFE: Analysis, Design, and Fabrication," 2010 Beam Instrumentation Workshop (BIW10), Santa Fe, New Mexico, USA, May 2010.
69. Gilpatrick, J. Douglas, P. Chacon, M. Gruchalla, D. Martinez, J. Power, B. Smith, M. Taylor, "LANSCE Harp Upgrade: Analysis, Design, Fabrication, and Analysis," 2010 Beam Instrumentation Workshop (BIW10), Santa Fe, New Mexico, USA, May 2010.
70. McCrady, Rodney C., B. Blind, J. D. Gilpatrick, M. Gruchalla, C. Pillai, J. F. Power, L. J. Rybrcyk, J. Sedillo, "LANSCE Beam Instrumentation and the LANSCE Refurbishment Project," 2010 Beam Instrumentation Workshop (BIW10), Santa Fe, New Mexico, USA, May 2010.
71. Gruchalla, Michael, P. Chacon, J.D. Gilpatrick, D. Martinez, J. D. Sedillo, "LANSCE-R Wire-Scanner Analog Frontend Electronics (AFE)," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
72. Gruchalla, Michael, P. Chacon, J.D. Gilpatrick, D. Martinez, S. Rodriguez, D. Satler, J. D. Sedillo, B. Smith, "LANSCE-R Wire-Scanner System," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.

73. Sedillo, J., J.D. Gilpatrick, M. Gruchalla, F. Gonzales, V. Kutac, D. Martinez, "First Test Results of the New LANSCE Wire Scanner," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
74. Rodriguez Esparza, S., Y.K. Batygin, J.D. Gilpatrick, M.E. Gruchalla, A.J. Maestas, C. Pillai, J.L. Raybun, F.D. Sattler, J.D. Sedillo, B.G. Smith, "LANSCE Wire Scanning Diagnostics Device Prototype," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
75. Rodriguez, S., B. Smith, A. Maestas, J. Raybun, J. Martinez, D. Sattler, J.D. Gilpatrick, J. Sedillo, M. Gruchalla, "Mechanical Design and Evaluation of the MP-11-Like Wire Scanner Prototype," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
76. Sedillo, J.D., J.D. Gilpatrick, D. Martinez, S. Rodriguez Esparza, M.E. Gruchalla, "Software Development for a CompactRIO-based Wire Scanner Control and Data Acquisition System," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
77. Gilpatrick, J.D., Y.K. Batygin, F. Gonzales, M.E. Gruchalla, V.G. Kutac, D. Martinez, C. Pillai, S. Rodriguez Esparza, J.D. Sedillo, B.G. Smith, "Wire Scanner Beam Profile Measurements: LANSCE Facility Beam Development," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
78. Gilpatrick, J.D., M.E. Gruchalla, D. Martinez, C. Pillai, S. Rodriguez Esparza, J.D. Sedillo, B.G. Smith, "Wire Scanner Beam Profile Measurements for the LANSCE Facility," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
79. Gruchalla, Michael E., Douglas Gilpatrick, James Daniel Sedillo, Derwin Martinez, "Wide-bandwidth Capture of Wire-scanner Signals," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
80. Sedillo, J.D., J.D. Gilpatrick, S. Rodriguez Esparza, M.E. Gruchalla, "LANSCE Wire Scanner System Prototype: Switchyard Test," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
81. Gruchalla, M.E., Thuot, M, "Managing Electromagnetic Interference in Large Instrumentation Environments," Invited Paper, 2014 International Beam Instrumentation Conference (IBIC 2014), Monterey, California, USA, September, 2014.
82. J. Sedillo, J. Nguyen, J.D. Gilpatrick, M. Gruchalla, LANSCE 1L Harp Data Acquisition System Upgrade, Invited Paper, 2014 International Beam Instrumentation Conference (IBIC 2014), Monterey, California, September, 2014.
83. Gruchalla, M.E., "Engineering, Design and Fabrication of 50-Ohm to 200-Ohm, High-Power, Balanced RF Transformer," invited paper, United States Air Force, Kirtland AFB, Albuquerque, New Mexico, October 22, 2016 (limited distribution).

84. Gruchalla, M.E., "UNIQUE MODULAR, HIGH POWER, CASCADABLE AMPLIFIER FOR SUPPORT OF EMP DIRECT DRIVE TESTING SBIR PHASE I FINAL REPORT," SBIR Phase I Final Report, SBIR Topic No. AF172-006, August 6, 2018.

PRESENTATIONS

1. Gruchalla, M., "Developments in Fiber-Optic Data Links," IEEE 1978 NEM Symposium, Albuquerque, New Mexico, May, 1978.
2. Gruchalla, M., "Fiber Optics in Field Applications," IEEE 1982 NEM Symposium, Albuquerque, New Mexico, May, 1982.
3. Gruchalla, M., "Grounding in Large Instrumentation Systems," Forth Annual Electrical Overstress/Electrostatic Discharge Symposium, Orlando, Florida, September, 1982.
4. Gruchalla, M., "Practical Considerations for Field Applications of Fiber-Optic Systems," invited presentation at the 1983 ISE Symposium, Albuquerque, New Mexico, April, 1982.
5. Gruchalla, M., "Practical Problems of Fiber Optics in Field Applications," 29th International Instrumentation Symposium, Albuquerque, New Mexico, May, 1983.
6. Gruchalla, M., "Grounding and Power Distribution in Instrumentation Systems," invited presentation at the 1984 ISE Symposium, Albuquerque, New Mexico, May, 1984.
7. Gruchalla, M., "Practical Problems of Fiber Optics in Field Applications," invited presentation at the 1984 ISE Symposium, Albuquerque, New Mexico, May, 1984.
8. Gruchalla, M., "A High-Speed, Log-Weighted Peak Level Recorder," IEEE 1984 NEM Symposium, Baltimore, Maryland, July 1984.
9. Gruchalla, M., "A Portable Programmable Pulser for Direct-Drive Testing," IEEE 1984 NEM Symposium, Baltimore, Maryland, July, 1984.
10. Gruchalla, M., "Practical Problems of Fiber Optics in Field Applications," invited presentation at AMP Special Industries Fiber-Optic Work Shop, Albuquerque, New Mexico, July, 1984.
11. Gruchalla, M., "Practical Aspects of Fiber Optics in Field Applications," invited presentation at Optoelectronic System Consultants' Fiber Optic Work Shop, Albuquerque, New Mexico, September, 1984.
12. Gruchalla, M., "A Portable Programmable Pulser and High-Speed, Log-Weighted Peak-Level Recorder for Direct Drive Testing," 1985 EMC Symposium, Zurich, Switzerland, March, 1985.
13. Gruchalla, M., "A Portable Programmable Pulser for Direct-Drive Testing," 1985 EMC Symposium EMP Work Shop, Zurich, Switzerland, March, 1985.
14. Gruchalla, M., "Performance of Linear Amplifier Systems in Direct-Drive Applications," IEEE 1986 NEM Symposium, Albuquerque, New Mexico, May, 1986.
15. Gruchalla, M., "Performance of Large Current Drivers," IEEE 1986 NEM Symposium, Albuquerque, New Mexico, May, 1986.

16. Gruchalla, M., "Automated Switching for Direct-Drive Pin-Drive Testing," IEEE 1986 NEM Symposium, Albuquerque, New Mexico, May, 1986.
17. Gruchalla, M., "Fiber Optics - A Brief Introduction," Invited Presentation, Western Regional Strain Gage Committee of the Society for Experimental Mechanics Winter Meeting, Livermore, California, February, 1987.
18. Gruchalla, M. E., "An Automatic Multi-Pin Test System For Direct Pin-Drive Testing," IEEE Instrumentation and Technology Conference, Boston, Massachusetts, April, 1987.
19. Gruchalla, M. E., "The Automatic Multi-Pin Test System For EMP Direct-Drive Testing," ISA 33rd International Instrumentation Symposium, Las Vegas, Nevada, May, 1987.
20. Gruchalla, M. E., "Magnetic Current Drivers For Bulk-Injection Testing," EMC Expo 87, San Diego, California, May, 1987.
21. Gruchalla, M. E., "An Automated Multi-Pin Test System For Direct Pin-Drive Testing," Invited paper, EMC Expo 87, San Diego, California, May, 1987.
22. Gruchalla, M. E., "An Automated Multi-Pin Test System For Direct Pin-Drive Testing," Instrumentation for Nuclear Weapons Effects Conference, Arlington, Virginia, October, 1987.
23. Gruchalla, M. E. and G. D. Sower, "Meaningful Specifications for Magnetic Current Drivers," Nuclear Electromagnetic Conference, Albuquerque, New Mexico, May, 1990.
24. Gruchalla, M. E., "A Practical Example Of An Engineering Problem," An Educational-Outreach presentation presented to high-school students in order to give them a working understanding of the engineering discipline, and how such skills as mathematics, physics, chemistry, organization, communication, as well as virtually all other skills offered at the high-school level are necessary in an engineering or other scientific discipline, Albuquerque, New Mexico, 1988 to present.
25. Gruchalla, M. E., "Personal Computer System Hardware," An Instructional Educational-Outreach series providing a hands-on presentation presented to numerous high-school level classes including Career Enrichment Center (CEC) and the Southwest Indian Polytechnic Institute (SIPI), Albuquerque, New Mexico, 1990 to present.
26. Gruchalla, M. E., Invited Oral Professional Testimony, United States House of Representatives Science Committee Hearing "Patent System and Modern Technology Needs: Meeting the Challenge of the 21st Century," House Science Committee Subcommittee on Technology, Congressional Record, Washington, DC, June 6, 1996.
27. Gruchalla, M. E., Invited presentation to the Albuquerque Career Enrichment Center Leadership reporting the work of the Student Engineering Team for the design, construction and successful fielding of a Microgravity Experiment successfully fielded on the U.S. Space Shuttle Mission STS-85 on Space Shuttle Discovery, Albuquerque, New Mexico, August, 1997.



28. Gruchalla, M. E., Invited presentation to the AlliedSignal Senior Leadership reporting the work of the Student Engineering Team for the design, construction and successful fielding of a Microgravity Experiment successfully fielded on the U.S. Space Shuttle Mission STS-85 on Space Shuttle Discovery, Albuquerque, New Mexico, August, 1997.
29. Gruchalla, M. E., "Review of Design and Durability Issues in the AlliedSignal Parallon 75 Product, and Recommended Corrective Actions," presentation to the AlliedSignal senior leadership, Albuquerque, New Mexico, November, 1999
30. Gilpatrick, J.D., D. Barr, D. Bruhn, L. Day, J. Ledford, M. Peck, R. Shurter, M. Settler, R. Valdiviez, J. Kamperschroer, D. Martinez, J. O'Hara, M. Gruchalla, D. Madsen, "Beam Diagnostic Instrumentation for a 6.7-MeV Proton Beam Halo Experiment, XX International Linac Conference, Monterey, California, August, 2000.
31. Barr, D., L. Day, J. D. Gilpatrick, D. Kerstiens, M. Stettler, R. Valdiviez, M. Gruchalla, J. O'Hara, J. Kamperschroer, "Beam-Profile instrumentation for Beam Halo Measurement: Overall Description, Operation, and Beam Data," 5th European Workshop on Diagnostics and Beam Instrumentation, Grenoble, France, May, 2001.
32. Barr, D., L. Day, J. Douglas Gilpatrick, Robert B. Shurter, Matthew Stettler, Robert Valdiviez, Derwin Martinez, Michael Gruchalla, James O'Hara, "Design and Experience with the WS/HS Assembly Movement Using LabVIEW VIs, National Instrument Motion Controllers, and Compumotor Electronic Drive Units and Motors," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
33. Gruchalla, Michael, Dean S. Barr, Lisa A. Day, Douglas Gilpatrick, Matthew W. Stettler, Derwin G. Martinez, James F. O'Hara, "Beam Profile Wire-Scanner/Halo-Scraper Sensor Analog Interface Electronics," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
34. Sellyey, William, J. Douglas Gilpatrick, Michael E. Gruchalla, Pilar S. Marroquin, "Experience with Photomultiplier Based Beam Loss Monitors (PMBLM) at the Low Energy Demonstration Accelerator (LEDA)," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
35. Gilpatrick, J., D. Barr. P. Colestock, L. Day, W. Sellyey, R. B. Shurter, M. Stettler, R. Valdiviez, J. Kamperschroer, M. Gruchalla, J. O'Hara, "Experience with the Low Energy Demonstration Accelerator (LEDA) Halo Experiment Beam Instrumentation," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
36. Gruchalla, Michael, Dean S. Barr, Lisa A. Day, Douglas Gilpatrick, Matthew W. Stettler, Derwin G. Martinez, James F. O'Hara, "Beam Profile Wire-Scanner/Halo-Scraper Sensor Analog Interface Electronics," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
37. Day, L. A., D. Barr, J. D. Gilpatrick, D. M. Kerstiens, M. W. Stettler, J. Kamperschroer, M. E. Gruchalla, J. F. O'Hara, "Automated Control and Real-Time Data processing for Wire Scanner/Halo Scraper Measurements," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
38. Gilpatrick, J., D. Barr, L. Day, M. Stettler, R. Valdiviez, J. Kamperschroer, D. Martinez, M. Gruchalla, J. O'Hara, "Beam-Profile Instrumentation for Beam-Halo Measurement: Overall Description and Operation," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.

39. Sellyey, W.C, J.D. Gilpatrick, M.E. Gruchalla, P.S. Marroquin, "Experience with Photomultiplier Based Beam Loss Monitors (PMBLM) at the Low Energy Demonstration Accelerator (LEDA)," 2001 Particle Accelerator Conference (PAC 2001), Chicago, Illinois, USA, June, 2001.
40. Gruchalla, Michael E., "Meeting United States Energy Demands – A Brief Review of the Magnitude of the Challenge," Invited Presentation at New Mexico Tech Engineering Department, New Mexico Tech, Socorro, New Mexico, March 10, 2006
41. Gruchalla, Michael E., "Meeting United States Energy Demands – A Brief Review of the Magnitude of the Challenge," Invited Presentation Albuquerque IEEE Section Meeting, Albuquerque, New Mexico, November 2, 2006.
42. Gruchalla, Michael E., "A Brief History of Los Alamos National Laboratory and the Manhattan Project," Invited Presentation Presbyterian Village North, Dallas, Texas, September 21, 2006.
43. Gruchalla, Michael E., "Meeting United States Energy Demands – A Brief Review of the Magnitude of the Challenge," Invited Presentation Presbyterian Village North, Dallas, Texas, April 24, 2007.
44. Gruchalla, Michael E., P. Chacon, D. Gilpatrick, D. Martinez, "LANSCE Wire Scanner AFE: Analysis, Design, and Fabrication," 2010 Beam Instrumentation Workshop (BIW10), Santa Fe, New Mexico, USA, May 2010.
45. Gilpatrick, J. Douglas, P. Chacon, M Gruchalla, D. Martinez, J. Power, B. Smith, M. Taylor, "LANSCE Harp Upgrade: Analysis, Design, Fabrication, and Analysis," 2010 Beam Instrumentation Workshop (BIW10), Santa Fe, New Mexico, USA, May 2010.
46. McCrady, Rodney C., B. Blind, J. D. Gilpatrick, M. Gruchalla, C. Pillai, J. F. Power, L. J. Rybrcyk, J. Sedillo, "LANSCE Beam Instrumentation and the LANSCE Refurbishment Project," 2010 Beam Instrumentation Workshop (BIW10), Santa Fe, New Mexico, USA, May 2010.
47. Gruchalla, Michael, P. Chacon, J.D. Gilpatrick, D. Martinez, J. D. Sedillo, "LANSCE-R Wire-Scanner Analog Frontend Electronics (AFE)," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
48. Gruchalla, Michael, P. Chacon, J.D. Gilpatrick, D. Martinez, S. Rodriguez, D. Satler, J. D. Sedillo, B. Smith, "LANSCE-R Wire-Scanner System," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
49. Sedillo, J., J.D. Gilpatrick, M. Gruchalla, F. Gonzales, V. Kutac, D. Martinez, "First Test Results of the New LANSCE Wire Scanner," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
50. Rodriguez Esparza, S., Y.K. Batygin, J.D. Gilpatrick, M.E. Gruchalla, A.J. Maestas, C. Pillai, J.L. Raybun, F.D. Sattler, J.D. Sedillo, B.G. Smith, "LANSCE Wire Scanning Diagnostics Device Prototype," 2011 Particle Accelerator Conference (PAC11), New York, New York, USA, March 2011.
51. Rodriguez, S., B. Smith, A. Maestas, J. Raybun, J. Martinez, D. Sattler, J.D. Gilpatrick, J. Sedillo, M. Gruchalla, "Mechanical Design and Evaluation of the MP-11-Like Wire Scanner Prototype," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.

52. Sedillo, J.D., J.D. Gilpatrick, D. Martinez, S. Rodriguez Esparza, M.E. Gruchalla, "Software Development for a CompactRIO-based Wire Scanner Control and Data Acquisition System," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
53. Gilpatrick, J.D., Y.K. Batygin, F. Gonzales, M.E. Gruchalla, V.G. Kutac, D. Martinez, C. Pillai, S. Rodriguez Esparza, J.D. Sedillo, B.G. Smith, "Wire Scanner Beam Profile Measurements: LANSCE Facility Beam Development," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
54. Gilpatrick, J.D., M.E. Gruchalla, D. Martinez, C. Pillai, S. Rodriguez Esparza, J.D. Sedillo, B.G. Smith, "Wire Scanner Beam Profile Measurements for the LANSCE Facility," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
55. Gruchalla, Michael E., Douglas Gilpatrick, James Daniel Sedillo, Derwin Martinez, "Wide-bandwidth Capture of Wire-scanner Signals," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
56. Sedillo, J.D., J.D. Gilpatrick, S. Rodriguez Esparza, M.E. Gruchalla, "LANSCE Wire Scanner System Prototype: Switchyard Test," 2012 International Particle Accelerator Conference (IPAC2012), New Orleans, Louisiana, USA, May 2012.
57. Gruchalla, M.E., Thuot, M, "Managing Electromagnetic Interference in Large Instrumentation Environments," Invited Presentation, 2014 International Beam Instrumentation Conference (IBIC 2014), Monterey, California, USA, September, 2014.
58. J. Sedillo, J. Nguyen, J.D. Gilpatrick, M. Gruchalla, LANSCE 1L Harp Data Acquisition System Upgrade, Invited Presentation, 2014 International Beam Instrumentation Conference (IBIC 2014), Monterey, California, USA, September, 2014.
59. Gruchalla, M.E., "Engineering, Design and Fabrication of 50-Ohm to 200-Ohm, High-Power, Balanced RF Transformer," invited presentation, United States Air Force, Kirtland AFB, Albuquerque, New Mexico, November, 2016 (limited distribution).
60. Gruchalla, M.E., "UNIQUE MODULAR, HIGH POWER, CASCADABLE AMPLIFIER FOR SUPPORT OF EMP DIRECT DRIVE TESTING, Technical Review of SBIR Phase I research, and technical challenges of Phase II research, Fiore Industries, Albuquerque, New Mexico, December 13, 2018.

PATENTS

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2. Distributed Push-Pull Amplifier, United States Patent Number 4,797,628.
3. Distributed Push-Pull Amplifier, Canadian Patent Number 1,283,713.
4. Nonlinear Transmission Line, United States Patent Number 5,157,361.
5. Distributed Push-Pull Amplifier, Australian Patent Number 629,857.
6. Amplificateur Symetrique Reparti, European Patent Number 89903441.7, French Application.
7. Distributed Push-Pull Amplifier, European Patent Number 89903441.7, German Application.
8. Distributed Push-Pull Amplifier, European Patent Number 89903441.7, Great Britain Application.
9. Electro-Optic Component Mounting Device, United States Patent Number 5,347,247.
10. Distributed Push-Pull Amplifier, Japanese Patent Number 2012756.
11. Distributed Push-Pull Amplifier, Russian Federation Patent Number 2103805.
12. Wide Bandwidth Balanced Transformer, United States Patent Number 7,443,263.

PERSONAL REFERENCES

Individual Contact Information Provided Upon Written Request

1. Dr. David Koller, Colleague, Air Force Research Laboratory (retired), associated 1968 – Present.
2. Dr. E. C. Hagen, Chief Scientist EG&G and Manager EG&G/EM Research and Development ~1980 – 1995, Science Advisor to the Governor of the State of Nevada 1999-2001, Principal Scientist NSTech, Nevada 1994 – ???, associated 1987 – Present.
3. Mr. Fred Shelly, External Customer, Los Alamos National Laboratory, Supervisor ATIC, Associated 2000 – Present.
4. Mr. Rodney (Woody) Woodstra, External Customer, Sandia National Laboratories, Engineer NG&C Department 5338, Associated 1987 – Present.
5. Mr. Randy Mayer, External Customer, Sandia National Laboratories, Engineer NG&C Department 5338, Associated 2000 – Present.
6. Ms. Elaine Harlan, Fiore Industries, Albuquerque, New Mexico, Associated 1980 – Present.
7. Mr. Jory Cafferky, Fiore Industries, Albuquerque, New Mexico, associated 1985 – Present.
8. Dr. J. D. Hutton, Supervisor, EG&G/EM and Honeywell (Retired), associated 1987 – Present.