



KEVIN R. CROSS, MSME

MIMO Expert | Vibration Test Systems | Hazardous Test Operations

KC Service & Consulting | 505-349-3645 | Kevin@kcscsolutions.com |

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PROFESSIONAL SUMMARY

Mechanical engineer with twenty years of hands-on experience in electrodynamic shaker systems, Multi-Input Multi-Output (MIMO) and Six Degree of Freedom (6-DOF) vibration testing, structural dynamics, and the design and commissioning of hazardous-environment test facilities. Holder of two U.S. patents in projectile and ignition system design. Author or co-author of over twelve technical conference papers in shock, vibration, and structural health monitoring. Currently operating KC Service & Consulting (KCSC), an independent engineering practice factory-authorized to service Unholtz-Dickie vibration test equipment.

CORE COMPETENCIES

- MIMO and 6-DOF Vibration Testing
- Vibration Test Facility Design
- Structural Dynamics Analysis
- Field Service Engineering
- Electrodynamic Shaker Service
- Custom Amplifier Design
- Fiber-Optic Remote Test Control
- Multi-System Test Integration
- Hazardous Test Operations
- Mass Properties Measurement
- Equipment Commissioning
- Team Leadership and Mentorship

PROFESSIONAL EXPERIENCE

KC Service & Consulting, Albuquerque, NM

June 2025 to Present

Founder and Principal Engineer

- Provide independent consulting and field service on electrodynamic shaker systems, vibration test facility design, and hazardous-environment test operations for aerospace primes, national laboratories, and industrial equipment manufacturers.
- Factory-authorized to service Unholtz-Dickie Corporation (UDCO) vibration test equipment, including shakers, amplifiers, slip tables, and APEX control systems, under a documented partnership.
- Design and build custom vibration test amplifiers featuring networked control, integrated diagnostics, real-time digital displays, and a single-power-source architecture capable of driving multiple shakers from one unit.
- Specialize in vibration test facility planning for hazardous and remote test environments, including system specification, infrastructure design, equipment commissioning, and operator training.

Sandia National Laboratories, Albuquerque, NM

September 2011 to March 2026

Principal Mechanical Engineer, R&D S&E

- Led engineering and technical teams executing hazardous vibration, shock, and pyroshock test operations across two remote test sites supporting national security programs.
- Led installation and commissioning of major Sandia vibration and shock test systems: a TEAM Tensor 18 kN multi-axis vibration system (2013), Unholtz-Dickie T2000 electrodynamic shaker (2018), Raptor POI-3500 shock test system, a second TEAM Tensor 18 kN system relocated from Army Aberdeen Proving Grounds (2024 to 2025), and the Unholtz-Dickie T5000 electrodynamic shaker (2025 to 2026). Each install included supporting facility infrastructure design, utility integration, and operator training.
- For the 2024 to 2025 TEAM Tensor relocation, designed and built a custom mobile semi-trailer platform housing a 400 kW generator, a 40-ton process chiller, 12 tons of HVAC capacity, and quick-disconnect cable and coolant-hose interfaces, enabling rapid deployment to alternate test sites.
- Oversaw refurbishment of a Raptor POI-3500 shock test system and a KSR330-20 test system, returning both to mission-ready service.

- Designed and deployed custom fiber-optic remote control solutions enabling safe operation of electrodynamic shakers, thermal conditioners, and other associated test equipment from isolated operator stations during hazardous test operations.
- Designed and built multiple custom MIMO test frames for nuclear deterrent program partners, integrating networks of electrodynamic shakers driven by QSC amplifier banks for synchronized multi-axis excitation.
- Served as subject matter expert in mass properties measurement (center of gravity, moments of inertia, products of inertia) and shock and vibration testing for the U.S. nuclear weapons complex and partner international test facilities.
- Contributed to the FY23 ERA-winning team for Survivability for Reentry Environments, demonstrating innovative techniques for qualifying hardware through realistic mechanical environment simulations.
- Mentored junior engineers and technologists in structural dynamics theory, hazardous test methodology, and the execution of complex test operations.

Remington Arms Company, Inc.

July 2007 to September 2011

Research Engineer

- Designed and developed new products and product-line extensions from concept through production, working directly with customer specifications and market requirements.
- Created the patented Hypersonic Steel shotshell line, featuring a novel ignition chamber and shot-confinement wad design. Product generated over \$8 million in profit in its first year.
- Designed custom manufacturing equipment, including an automated inspection machine for shotgun primer pellets, achieving full-rate quality inspection without slowing the production line.
- Implemented a SolidWorks Enterprise PDM data-management system across multiple remote sites; served as corporate administrator and user trainer.
- Member of the corporate Strategic Business Unit team, providing technical input to executive-level strategic planning.

EDUCATION

Master of Science, Mechanical Engineering

Clarkson University, Potsdam, NY | 2007

Thesis: Numerical and Experimental Investigations of Bridge Health Monitoring Using Modal Curvature and Instantaneous Phase Methods

Bachelor of Science, Mechanical Engineering (Minor in Mathematics)

Clarkson University, Potsdam, NY | 2005

Associate of Science, Engineering Science

Hudson Valley Community College, Troy, NY | 2003

PATENTS

- RA Brands, L.L.C. (2009). Shot Confinement Wad. U.S. Patent Application 61/149,059.
- RA Brands, L.L.C. (2008). Wad with Ignition Chamber. U.S. Patent Application 61/113,286.

SELECTED PUBLICATIONS

- Cross, K., Melendez, G., Arnold, F., Brenner, K., Throneberry, G., Soine, D. (2025). "Combining Pyroshock with MIMO Vibration." International Modal Analysis Conference (IMAC), Orlando, FL.
- Throneberry, G., Melendez, G., Cross, K. (2025). "Developments on Combined Thermal-Vibration MIMO Testing." IMAC, Orlando, FL.
- Cross, K., Zwink, B., Melendez, G. (2023). "Natural Excitation Within a Test Frame." IMAC, Austin, TX.
- Zwink, B., Cross, K., Fowler, D. (2023). "MIMO Vibration Test Design for BARC Challenge Problem." IMAC, Austin, TX.
- Throneberry, G., Paripovic, J., Cross, K., Sanchez, M., Aulbach, S., Brown, T. (2023). "Comparative Failure Analysis of Components Exposed to Multi-axis and Single-axis Vibration Testing." IMAC, Austin, TX.
- Nelson, G., Cross, K., Hunter, N. (2018). "A Systematic Evaluation of Test Specification Derivation Methods for Multi-Axis Vibration Testing." IMAC, Orlando, FL.

- Hunter, N., Cross, K., Nelson, G. (2018). "The Cross Spectrum in Multiple Input Multiple Response Vibration Testing." IMAC, Orlando, FL.
- Nelson, G., Cross, K., Hunter, N. (2017). "Combined Multi-Axis Vibration and Acoustic Environment Testing." Sandia National Laboratories conference paper SAND2017-3294D.
- Ross, M., Jacobs-O'Malley, L., Tipton, D., Cross, K., Hunter, N., Harvie, J. (2017). "Input Test Specification for 6 DOF." IMAC, Garden Grove, CA.
- Jacobs-O'Malley, L., Nelson, G., Ross, M., Harvie, J., Cross, K., Hunter, N. (2017). "Experimental Execution of 6-DOF Tests Derived from Field Tests." IMAC, Garden Grove, CA.
- Ross, M., Jacobs-O'Malley, L., Tipton, D., Nelson, G., Cross, K., Hunter, N., Harvie, J. (2017). "6-DOF Shaker Test Input Derivation from Field Test." IMAC, Garden Grove, CA.
- Nelson, G., Hunter, N., Cross, K. (2016). "Defining the Error of Single and Multi-Axis Vibration Tests: A Move from Qualitative to Quantitative Metrics." 87th Shock and Vibration Symposium, New Orleans, LA.

TECHNICAL SKILLS

Engineering and Analysis Software: Python, MATLAB, LabVIEW, Maple, Minitab

Test and Data Acquisition: Data Physics SignalStar, Siemens Simcenter Testlab, Spectral Dynamics Jaguar, Sandia Rattlesnake, Unholtz-Dickie APEX

CAD and CAM: SolidWorks (incl. EPDM), PTC Creo, Autodesk Fusion 360, 3D Studio Max

Finite Element Analysis: Abaqus, Ansys, Simulink

AI Engineering Tools: Anthropic Claude (incl. Claude Code and the Agent SDK) for technical documentation, code generation, data analysis, and engineering workflow automation

Productivity: Microsoft 365 (Teams, Excel, Word, PowerPoint, Project, Outlook), Adobe Creative Suite