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## Core Engineering Services

- **Computational Electromagnetics**

Proprietary FDTD electromagnetic simulation engine developed over 25+ years and used extensively across the defense community. Full-wave 3D analysis for antenna performance, scattering, coupling, and near-field characterization. Custom simulation tool development and RF materials characterization for accurate modeling of complex structures.

- **Antenna Design & Optimization**

Inventor of the Fragmented Aperture Antenna (US Patents 6,323,809 & 11,228,102) — a genetically optimized antenna topology that routinely approaches theoretical performance limits. Broadband and wideband antenna design from UHF through millimeter wave. Phased array element design and optimization. Electrically small antenna design. Custom impedance matching network design using proprietary tools.

- **Platform Integration & Installed Performance**

Installed antenna performance analysis on vehicles, aircraft, and ships. EMI/EMC assessment and mitigation. Radar cross section (RCS) prediction, shaping, and treatment design for low-observable platforms. Co-site interference analysis for multi-antenna platforms. FANUC robot-based radome and canopy RF scanning for military specification compliance.

- **AI/ML-Accelerated Engineering (Coming August 2026)**

Machine learning surrogate models trained on proprietary FDTD data for rapid design-space exploration. Neural network-driven antenna geometry optimization. Physics-informed ML models that maintain electromagnetic rigor while accelerating simulation. AI-orchestrated design pipelines for faster iteration cycles.

- **SBIR/STTR Proposal Support**

Technical volume writing and proposal development for SBIR/STTR grants with strong structure and clarity. Innovation narrative development, feasibility arguments, work plans, milestones, and alignment with solicitation requirements. Ideal for small businesses needing experienced technical writing to present a credible, fundable approach.

- **Patent Drafting Support**

Technical drafting support for patent materials prepared for attorney review. Invention disclosure organization, technical descriptions, figure preparation, and structured explanations of complex engineering innovations. Experience includes four issued US patents in antenna and electromagnetic technology.

## Industries Served

Defense & Aerospace · Telecommunications (5G/6G) · Satellite & Space · IoT & Embedded Systems · Automotive · Intelligence Community

## Additional Professional Services

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### • AI for Small Businesses & Law Firms

Practical AI workflow implementation to reduce repetitive work and improve consistency. Intake organization, drafting support, research workflows, and reusable templates. Secure, maintainable processes without heavy IT overhead. Deliverables include prompt libraries, SOPs, checklists, example outputs, and staff training.

### • Paralegal Support & Document Preparation

Professional document preparation and administrative support for individuals and small firms. Form preparation, records organization, proofreading, and filing readiness. Assembly of client-ready document packets with focus on accuracy and professionalism. Non-legal support only — no legal advice or representation.

### • Prison Consulting & Reentry Support

Structured non-legal support for planning, documentation, and reentry organization. Checklist-based timelines, key records organization, and practical reentry planning. Helping families prepare action steps, track requirements, and organize resources to reduce uncertainty during transitions. Not legal advice or court representation.

### • Notary Public Services

Professional notarizations by appointment in Marietta, Georgia. Clear scheduling, identity verification, and efficient appointments. Notary services do not include legal interpretation, drafting, or legal advice.

## Engagement Options

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### • Initial Consultation

Confirm goals, scope, timeline, and deliverables (phone or virtual). No-obligation discussion to determine fit.

### • Hourly Support

Flexible support for ongoing tasks, technical work, and document development as needed.

### • Fixed-Fee Projects

Defined scope and deliverables with agreed pricing before work begins.

### • Retainer Agreements

Reserved capacity for clients requiring ongoing engineering support or advisory services.

## Proprietary Tools & Credentials

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### • Proprietary FDTD Solver

Production-grade, full-wave 3D electromagnetic simulation engine built from the ground up. Used by multiple defense contractors and government laboratories.

### • Antenna Matching Suite

Specialized tools for broadband impedance matching, combining circuit synthesis with full-wave validation.

### • Publications & Patents

US Patents 6,323,809 & 11,228,102 (Fragmented Aperture Antennas) · US Patent 10,203,202 (Non-Contact Coating Thickness) · US Patent 5,689,275 (Photonic Bandgap Antennas) · IEEE AP-S Best Paper Award (1993) & Runner-up (1992) · Author: *Fragmented Aperture Antennas* (in progress) · Google Scholar: scholar.google.com/citations?user=445KFCoAAAAJ

## Important Notes

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- No legal advice or legal representation is provided. Paralegal/document services are non-legal support only.
- Notary services do not include legal interpretation, drafting, or advice.
- Engineering consulting does not include PE-stamped plans unless explicitly contracted with a licensed PE.