



ANS COMPOSITE

Adaptive self-healing electromagnetic shielding — the transition pathway from architecture to fielded field-of-use license

Rachael V. Hager dba ANS Composite · Franklin County, Virginia · Licensed, never manufactured

NON-TRADITIONAL DEFENSE CONTRACTOR

SBA-CERTIFIED WOSB

OASW(SO/LIC) GATE 1 AWARD

PUBLIC RELEASE · NO PRICING

POSITIONING

ANS Composite owns and licenses **an adaptive, self-healing electromagnetic shielding architecture** — a single-pass composite that hardens platforms against electromagnetic and directed-energy threats **with no host redesign**. The component dynamics are established art at **TRL 4–6**. The architecture that integrates them is ANS's, and sits at **TRL 2–3 comprehensive**. **This brief is the pathway between those two numbers** — the gates, the evidence each one produces, and the authorities that carry it to the warfighter.

THE DEFICIT

WHAT IT COSTS TODAY

- **Depot reliance.** Shielding damage means the platform comes off the line and goes back to a depot. The repair tail is the availability problem.
- **Parasitic mass.** Conventional protection is a stack — foil, gasket, coating, fastener — carried as dead weight on every sortie.
- **Seam and aperture failure.** A multi-component stack fails where the components meet, not in the middle of a panel.

THE SHIFT

ARCHITECTURALLY, ONE CHANGE

- **From** a multi-layer parasitic stack bolted onto the platform...
- **To** a single-pass structural enclosure that heals itself in place — no depot return, no stack, no seam to fail.

*Swap a copper shield for this one and you leave about **four-fifths of that weight on the ground**. On an uncrewed system, every gram removed is endurance, range, or payload.*

DUAL-TRL CONVERGENCE

MATURE COMPONENT TRACKS

TRL 4-6 · ESTABLISHED ART

- 01 Broadband attenuation**
30 MHz–100 GHz design range; ASTM D4935-18 characterization is valid to 1.5 GHz
- 02 Self-repair kinetics**
Thermally triggered recovery of conductivity after mechanical damage
- 03 Additive processing**
Single-pass printable deposition; conforms to complex geometry

INTEGRATION · THE INVENTIVE STEP

INTEGRATED SYSTEM ARCHITECTURE

TRL 2-3 · COMPREHENSIVE

Multi-domain filing bundle

Four U.S. filings, one architecture. 100% founder-owned, filed at private expense before any Government dollar — background IP.

Platform-agnostic envelope

Applied as coating, structural skin, or printable ink. Integrates without redesigning the host.

ANS claims no new physics. The constituent mechanisms are published, mature, and de-risked. What is patent-pending is the architecture that combines them into one adaptive, self-healing, load-bearing system — and **the integration envelope is the only thing this pathway exists to mature.**

DESIGN ENVELOPE — AND WHERE EACH NUMBER COMES FROM

30 MHz – 100 GHz

Broadband design range

FILED SPEC

40 – 52 dB

Shielding effectiveness, X-band, from a single 0.1 mm coating.
80 dB+ in multilayer and structural configurations.

DESIGN TARGET

>90% in <5 min

Conductivity recovery, ≤80 °C trigger

FILED SPEC

Under 1/6 the density

of **copper foil**, and under half that of **aluminum**. A fraction of the installed mass of the **formed metal shielding structure** it replaces.

DESIGN TARGET

MIL-STD-188-125

-class HEMP hardening, configurable toward

DESIGN TARGET

Every figure above is labelled for provenance, deliberately. Filed spec = it appears in a filed application and is traceable to the specification. Design target = engineered from published constituent literature. **Neither is a measurement on a fabricated article — nothing has been fabricated yet, and page 2 is the plan to change that.** Formulations, ratios and process parameters are not published. **Production know-how is licensed separately to qualified U.S. compounders under confidentiality** — it is not part of the qualification data package the Government receives, and is not needed to produce one.

★ **The weight comparison, stated honestly.** By density the composite is **under one-sixth that of copper foil** and **under half that of aluminum**. The comparison that matters operationally is against the **formed metal shielding structure it replaces** — enclosure wall, liner, gaskets and the backing that carries them — where the installed mass difference is far larger. Bare foil at equal shielding is not the incumbent; formed metal is.

THE PORTFOLIO — FOUR FILINGS, ONE ARCHITECTURE

FILING 01 · THE BASE LAYER

Adaptive Self-Healing Shield

Frequency-adaptive broadband shielding that **self-heals battle damage in the field** — no depot return.

FILING 02 · THE HARDENING

Multi-Domain EM Defense

EMP, high-power-microwave and directed-energy hardening that keeps **kill-web nodes** — satellites, C2, comms — alive under attack.

FILING 03 · THE STRUCTURAL FRAME

HETD Structural Skin

Shielding built **into the load-bearing structure** — blast, ballistic and hypervelocity impact plus co-incident EM pulses, in one member.

FILING 04 · THE MANUFACTURING KEY

ARI Printable Ink

The whole defense as a **single-pass 3D-printable ink**. Print the protection in; never paint it on.

★ Filings 02 and 03 together address **nuclear-event survivability** — one blocks the electromagnetic pulse, the other hardens the structure against the radiation. **This pathway matures Filings 01 and 02.** Filings 03 and 04 each carry their own shorter ladder afterward, because each pays only to prove what is new to it — never to re-prove the material underneath.

SCOPE OF THIS LADDER

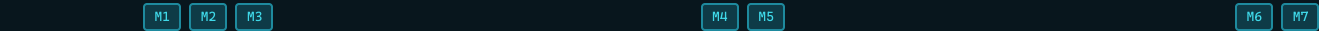
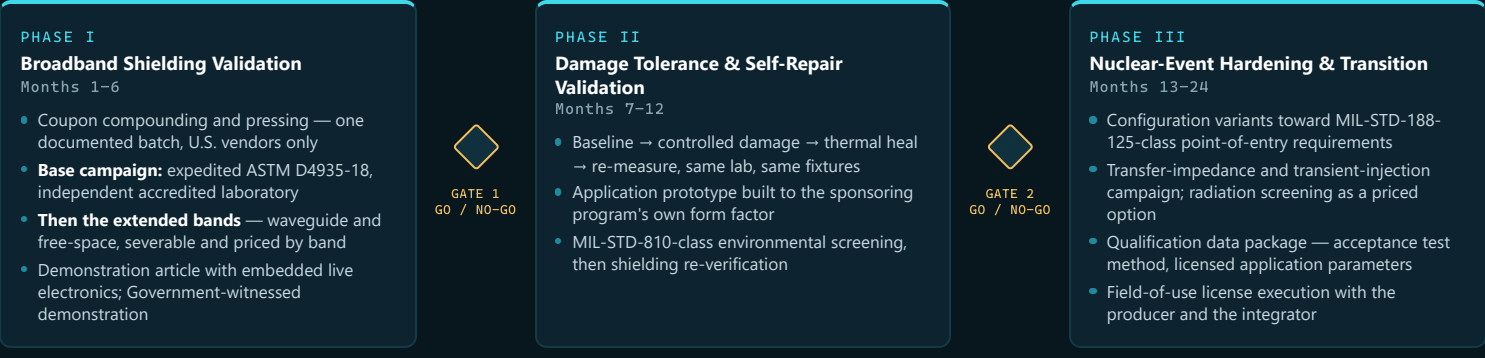
Filings 01 + 02 — the shielding material.

Filings 03 (structural skin) and 04 (printable ink) each transition on their own shorter ladder — see page 3.

THE VERIFICATION RUNWAY

One rung of the validation ladder at a time.

Three severable phases. Two Government decision gates. Seven milestones, each one an **objectively verifiable artifact** — a dataset, a witnessed demonstration, a delivered article — never a subjective judgement and never a measured technical result. Capability is proven upward through the bands and performance levels a program actually requires, **funded according to what the Government elects to pursue**.



GATING MATRIX — OBJECTIVE, VERIFIABLE, GOVERNMENT-CONTROLLED

M	MILESTONE OBJECTIVE	EXIT CRITERIA — THE ARTIFACT	METHOD / STANDARD	MECHANISM
M1	Vendor agreements executed	Purchase orders placed within 30 days of program start	–	OT base task
M2	Broadband shielding established base band, then extended bands	Validated shielding dataset from an independent ISO/IEC 17025 laboratory — one band group per priced increment	ASTM D4935-18 → D5568 IEEE Std 2715 · free-space	OT milestone + severable options
M3	Capability shown to the Government	Government-witnessed demonstration + Phase I report	Demonstration protocol	Gate 1 → Phase II
M4	Damage tolerance and self-repair	Damage-and-recovery dataset — baseline, damage, heal, re-measure	Damage protocol + ASTM D4935-18	OT milestone
M5	Prototype survives the environment	Prototype article + environmental dataset	MIL-STD-810 501/502/507/514/516	Gate 2 → Phase III
M6	Hardening configuration characterized	Nuclear-event hardening dataset on two configurations	MIL-STD-188-125-class IEEE Std 1302 · SAE ARP 1705	OT milestone
M7	Transition package delivered	Qualification data package + executed-or-execution-ready field-of-use license	Acceptance test method	License execution

WHERE M2 ACTUALLY GOES — THE BAND GAUNTLET

ASTM D4935-18 is the first rung, not the whole ladder. It is a coaxial transmission-line method and it stops at **1.5 GHz** — it establishes the material shields, in the band where E1-EMP and conducted transients live. **Everything above 1.5 GHz is a different method and a separate priced increment**, elected band by band by the sponsoring program.



- Published methods, end to end. Every band is measured against a named industry standard — ASTM D4935-18, ASTM D5568, IEEE Std 2715 — by an ISO/IEC 17025-accredited laboratory. No house methods, no self-reported numbers.
- Seams and closures are measured separately — transfer impedance per IEEE Std 1302 and SAE ARP 1705. A panel that shields and a box that shields are not the same test.
- Why it is built this way. A program that only needs protection through **X-band buys through X-band**. Nobody funds 110 GHz to solve a 2 GHz problem. Above 40 GHz the free-space work uses an established laboratory technique for which no consensus standard has been published; that is disclosed in the test plan.

HOW THE WORK IS RUN

THE DECISION RULE

Zero un-gated development. The Government retains stop / go authority at every node.

Every gate is backed by an independent physical deliverable — a dataset from an accredited laboratory, a witnessed demonstration, or a delivered article. **A milestone is never a measured technical result:** ANS is paid for running the test correctly, never for the test coming out well. **If a gate returns NO-GO the program proceeds on the named fallback architecture at the same price and the same schedule** — no payment is reduced, delayed, or conditioned on a gate outcome.

CUSTODY

- Every specimen and article **stays ANS property in ANS custody** and travels with the principal investigator.
- **Measurement-only** evaluation — no disassembly, no reverse engineering, no chemical or spectroscopic analysis. One exception: a **sectioning-reveal spare** fabricated expressly for Government examination.

CRITICAL PATH

- **No Government facility sits on the critical path.** No GFE, no Government lab time, no facilities requested.
- The only schedule driver is an **independent commercial laboratory's booking queue** — a vendor ANS books, pays, and manages. **The Government's schedule exposure is limited to the two decision gates it controls.** The whole ask: **a named program liaison with a named alternate**, plus venue coordination for the demonstration.

HOW THE WORK IS FUNDED

- Work is **scoped, priced, and paid as it is performed**, against objectively verifiable tasks. That structure is what lets a small business put **program management, subject-matter expertise, and engineering fully on this program** — rather than carrying it part-time around outside income, which is how schedule slips before it ever starts. **The Government pays for delivered work, and the work stays expedited.** Payment structure and cadence are set in the agreement.

WHAT ANS ASKS OF THE GOVERNMENT

✓ **A named liaison** with a named alternate

✓ **Venue coordination** for the witnessed demonstration

✓ **The field of use, named**, and the environment it must survive

✗ **No GFE. No Government lab time. No facilities. No cost-share.**

RISKS — NAMED HERE, NOT DISCOVERED LATER

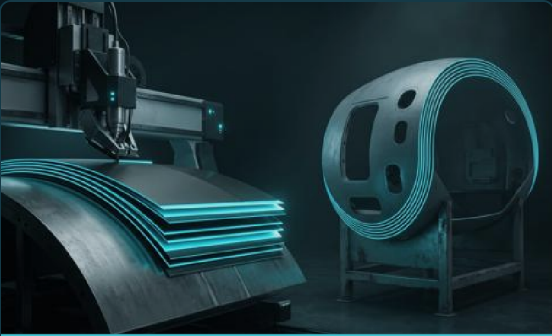
LABORATORY SCOPE

- To ANS's knowledge **no U.S. commercial laboratory lists ASTM D4935 at method level on its ISO/IEC 17025 scope.** The identical constraint binds every offeror in this field — a market condition, not an ANS deficiency.
- **Why it does not govern the outcome.** The conclusion never rests on one method. The **same shielding is re-measured in the higher bands** by waveguide and free-space methods that laboratories do carry on scope, and the Phase I gate closes on a **Government-witnessed demonstration** — not on a certificate. Testing is placed with an ISO/IEC 17025-accredited laboratory either way, under its documented measurement-uncertainty programme.

SCHEDULE

- Durations are set **deliberately long** — constituent procurement runs a six-week lead and the accredited laboratory queue governs everything downstream. Firm-fixed milestones **pay on completion and carry no schedule penalty to the Government.**

FILINGS 03 AND 04 — CONTINUED DEVELOPMENT IN SEPARATE PROGRAMS



FILING 03 · NEXT PROJECT

The structural skin

Shielding built into the load-bearing structure. Its own shorter program — **structural and impact qualification only**. Scoped when a platform sponsor names a load case.

WHY THE NEXT TWO ARE SHORTER

Page 2 proves **the material** — that it shields, that it heals, that it survives. **Filings 03 and 04 are the same material in a different form.** Each proves only **what is new to it**, never re-proving what is already measured.

The expensive rung is climbed once.



FILING 04 · NEXT PROJECT

The printable ink

The same defense as a single-pass printable ink. Its own shorter program — **process and print qualification only**. Scoped when a producer names a geometry.

THE STATUTE STACK

Fund the proof under an Other Transaction. License the field you need. Scale it through licensed U.S. producers.

TIER 1 PROTOTYPE & VALIDATION	10 U.S.C. § 4022 Other Transactions for prototype projects • Sits outside the FAR. IP terms are negotiable by statute — there is no default position to negotiate up from, and nothing is conceded by signing. • § 4022(d)(1)(A) is satisfied where a non-traditional defense contractor participates to a significant extent. ANS is one. ANS does not need to be the prime for the condition to be met. • Funds the laboratory campaign, the demonstration article, and the engineering that produces the evidence on page 2. A priced deliverable, not a subsidy.
TIER 2 DIRECT LICENSING	10 U.S.C. § 3793(2) — a license under patents and applications for patents • § 3793 lets a military department spend procurement funds on "licenses under copyrights, patents, and applications for patents" where the acquisition relates to supplies or processes used by or useful to that department. Applications — the Department can license ANS's filings now, before any patent issues. • The old DFARS boilerplate is Reserved for DoD — subpart 227.70 and the 252.227-7012 format, under Class Deviation 2026-00036 (eff. 1 Feb 2026). The statute is untouched; only the form is gone. The license is negotiated as a bespoke instrument. • Non-exclusive and field-of-use. One license reaches every prime and subcontractor performing that work, so no program office negotiates with a vendor on ANS's behalf. Single-department licenses only.
TIER 3 PRODUCTION AT SCALE	10 U.S.C. § 4022(f) follow-on production · plus qualified U.S. compounders under license • A follow-on production award is available where competitive procedures were used to select participants and the prototype was successfully completed. • Any qualified U.S. compounder may produce under license. The Government is never locked to a single vendor, and ANS is never asked to become one. ANS does not manufacture.

DATA RIGHTS – THE POSITION, STATED PLAINLY

- **ANS owns the technical data.** The Government receives a license to use it for the licensed field of use — no release to third parties without written consent, and **nothing converts to anything on a timer.**
- **Under an Other Transaction the DFARS data-rights defaults do not apply unless the parties agree to them** — so there is nothing to concede at the opening.
- **What the Government receives:** a performance specification and qualification data — enough to **buy it, qualify it, and accept it.** The formulation is not part of that package, and is not needed for any of it.
- **Where the formulation does go — and why that is good for the Government.** Production know-how is licensed **separately, under confidentiality, to qualified U.S. compounders** who actually make the material. That gives the Government **multiple qualified sources competing on price and capacity**, no vendor lock, and no single point of failure — **without any Government office having to hold, protect, or defend a trade secret.**

PARALLEL FIELDS

Army Ground

Aerospace & Aviation

Undersea & Shipboard

Satellites & Space

Missile Defense

+ the next field

Each license covers a **single field of use** — written narrow, written plainly. **No program waits behind another program's schedule, and no application waits on one manufacturer's capacity.**

PAIRING WITH A BUILDER — TWO CAPABILITIES, ONE TEAM

- Where a solicitation calls for delivered hardware — a DIU Commercial Solutions Opening, for example — **ANS teams with a qualified build-and-integration partner.** The partner holds the agreement and delivers the article; **ANS licenses the field of use and provides the engineering behind it.**
- **The program office gets both halves at once:** the party that owns the architecture and the party that can produce at rate — **and the licence is written so the Government is never locked to either one.**

WHY NOW

9 APR 2025 Executive Order 14265 Modernizing Defense Acquisitions and Spurring Innovation in the Defense Industrial Base — directs a plan built on a first preference for commercial solutions and a general preference for Other Transactions Authority.	15 APR 2025 EO 14271 & EO 14275 Ensuring Commercial, Cost-Effective Solutions in Federal Contracts; Restoring Common Sense to Federal Procurement — the commercial-first preference and the FAR overhaul, government-wide.	7 NOV 2025 The Warfighting Acquisition System Secretary of War memorandum making speed to capability delivery the organizing principle, commercial offerings the default, and non-FAR-based instruments the preferred agreements.	18 DEC 2025 FY2026 NDAA § 824(b) Directs the elimination of procedural barriers that disproportionately affect small business concerns and non-traditional defense contractors — the statute names exactly what ANS is.
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IT IS FIELDIED, NOT ANNOUNCED

- The November 2025 memorandum **replaced Program Executive Officers with Portfolio Acquisition Executives.** The Air Force stood its PAE structure up in **January 2026**, the Navy in **March 2026** — **this is the org chart, not a policy awaiting implementation.**
- **And the demand is named too.** Executive Order 14179 — *Removing Barriers to American Leadership in Artificial Intelligence* — prioritises the very nodes this architecture protects: **forward-edge microelectronics, unmanned systems, and AI compute.** Field-of-use licensing gives a program immediate access to **deployable electromagnetic hardening without a multi-year supply-chain build-out.**

WHERE TO START

THE FASTEST USEFUL STEP Name the field of use and the environment it has to survive. ANS returns a rough order of magnitude, priced by rung, with the gates drawn where you want them.	IF THIS IS NOT YOUR PORTFOLIO • The most valuable thing you can do is name the office where electromagnetic survivability is already a written requirement. One pointer is worth more than a meeting.
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