



PIONEERING THE FUTURE OF ELECTROMAGNETIC PROPULSION

OUR MISSION

At Arcflash Labs, we envision a world where archaic gunpowder-based weapons are relics of the past. We strive to leverage modern technology to create safer and more efficient alternatives for personal defense.

EXECUTIVE SUMMARY

1

OVERVIEW

Arcflash Labs specializes in advanced weapon technology, developing coilguns for civilian defense, law enforcement, and Department of Defense applications. Our company, established by two aerospace engineers and Air Force veterans, stands at the forefront of the changing defense and law enforcement sectors.

2

WHAT WE DO

We create proprietary electromagnetic propulsion systems that provide unparalleled tactical advantages. With our technology, troops can fire silently, preventing adversaries from locating them based on sound. Our products also allow for easy maintenance and adaptability, providing easy power adjustment and projectile options on the fly.

3

PRODUCTS

We offer an array of stand-alone boards, components, and fully assembled electromagnetic accelerators. We pioneered the first-ever portable EM accelerator technology for the general public, and offer customizable solutions for various applications and industries.

4

OUR TARGET

Civilian defense consumers seeking advanced home defense solutions, law enforcement agencies in need of humane crowd control options, and the Department of Defense with specialized counter-Unmanned Aircraft Systems and anti-material weaponry requirements.

5

WHY US?

Just as the switch to electric is transforming the automotive industry, electromagnetic propulsion technology will soon revolutionize defense. We're at the precipice of a significant shift. The question isn't if electromagnetic propulsion will replace gunpowder, but when-- and we're positioned to lead the shift.

WHEN TRADITION MEETS TACTICAL RISK

When our Airmen are on the battlefield, every shot counts - but **traditional gunpowder weapons betray our troops' positions with every round fired.** The noise from M-4s, M-16s, and other weapons removes any chance for tactical advantage, putting our soldiers' lives at risk. Silencers can help, but not nearly enough. Our Airmen remain at the mercy of their own gunfire's echo, with enemy troops and audio-sensing technologies ready to pinpoint their location and launch deadly counterattacks.



BUT IT'S NOT JUST ABOUT THE NOISE...

The logistical challenges presented by the storage of gunpowder weapons are its ultimate Achilles heel. Flammable and volatile, these weapons demand meticulous safety precautions, and their fixed caliber restricts adaptability, causing a lack of versatility for diverse missions. This, compounded by the dependency on a steady resupply chain, limits the operational agility and forward momentum of our teams. **We're locked in an outdated framework that's holding our forces back and potentially costing lives.**

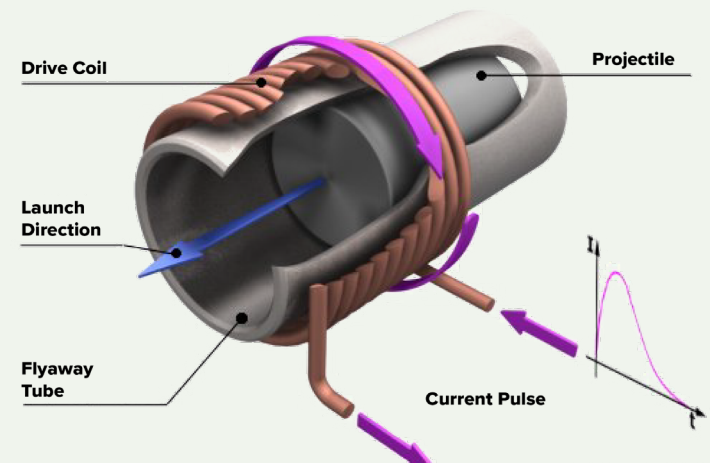
SO, WHAT'S THE SOLUTION?

THE **SILENT** SOLUTION

We're propelling into a new era of tactical warfare with our groundbreaking technology - pulsed power accelerators.

These innovative weapons harness electrified coils to generate magnetic fields, propelling ferromagnetic projectiles to high speeds. The revolutionary design eliminates the need for explosive propellants, removing the inherent risks associated with traditional gunpowder-based systems.

Simple Reluctance Launcher



A streamlined structure with no moving parts simplifies cleaning and maintenance, promoting longevity and operational readiness. This user-friendly design expedites the learning curve for our Airmen, fostering proficient use in shorter timescales.

The true tactical advantage, however, lies in the silence. The absence of a traditional gunshot sound offers a covert operational edge, maintaining our position secrecy while still delivering effective firepower. Moreover, with adjustable power and projectile caliber, these weapons afford a versatility that matches the diverse needs of modern warfare.



GUNPOWDER BASED WEAPONS **[M-4, M-16]**

ARCFLASH'S PULSED POWER ACCELERATORS

Volume	Loud (165 dB)	Silent (>40 dB)
Moving parts	Jams from moving bolts and parts	Zero moving parts = zero misfeeds, jams
Cleaning	Requires extensive cleaning	No gunpowder = no dirt & no cleaning
Caliber	Fixed	Adjustable
Power	Fixed	Adjustable

GR-1 "ANVIL" COILGUN: **THE FUTURE OF HIGH ENERGY WARFARE**



A revolution in firearms, the GR-1 "Anvil" Coilgun is an embodiment of cutting-edge technology, representing a new era of power, efficiency, and tactical advantage.

75 FT-LBS

of kinetic energy

480GR

slug

75% POWER

ballistics gel penetration

100

rounds per minute

\$5,000

retail price

200+

fps

40

shots per battery

0.5"

bore

Equipped with integrated laser and floodlights, this coilgun ensures optimum visibility and targeting accuracy. The GR-1 "Anvil" has completed an external safety review, reinforcing our commitment to delivering a product that is as reliable as it is revolutionary.

THE EMG-02: **THE ULTIMATE FULL AUTO GAUSS ACCELERATOR**

This sleek, powerful Gauss Accelerator is crafted for those who demand durability, practicality, and efficiency.



15 FT-LBS

of kinetic energy

130GR

slug

3-5"

ballistics gel penetration

800

rounds per minute

\$2,500

retail price

210+

fps

300

shots per battery

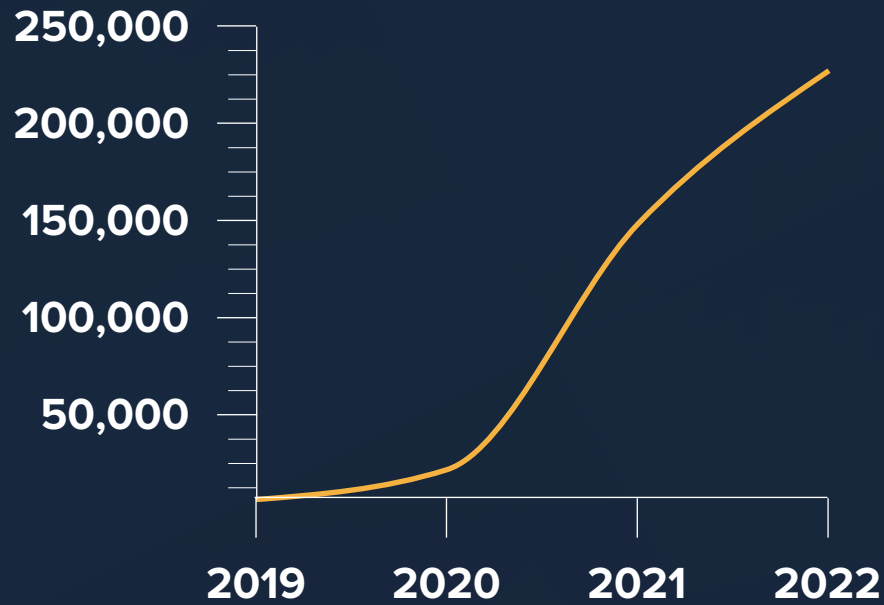
0.31"

bore

The EMG-02 achieves the same muzzle energy as a PCP air rifle without the need for expensive air compressors, incorporates integrated lasers for precise targeting, and meets stringent safety standards through a completed internal review.

TRACTION

REVENUE



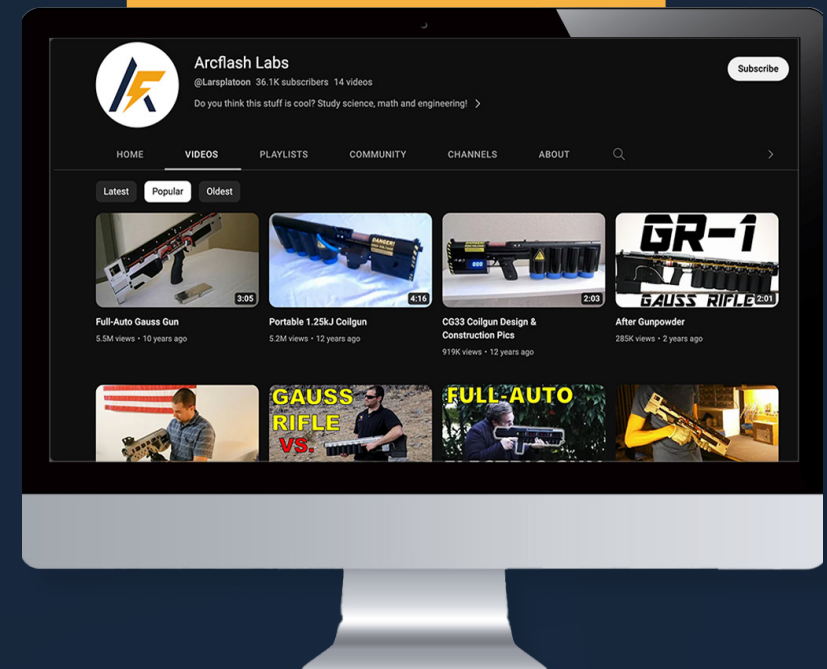
YoY growth of 194%, 540%, and 53% respectively

UNITS SOLD

EMG-01-A	10 in first 3 months
EMG-01B	25 in first 4 months
GR-1 "Anvil"	30 in first 8 months

* 25+ EMG-02 guns sold on pre-order

12M+ views, 35k subscribers



NEWS COVERAGE



engadget



POPULAR
SCIENCE

DIGITAL TRENDS GIZMODO

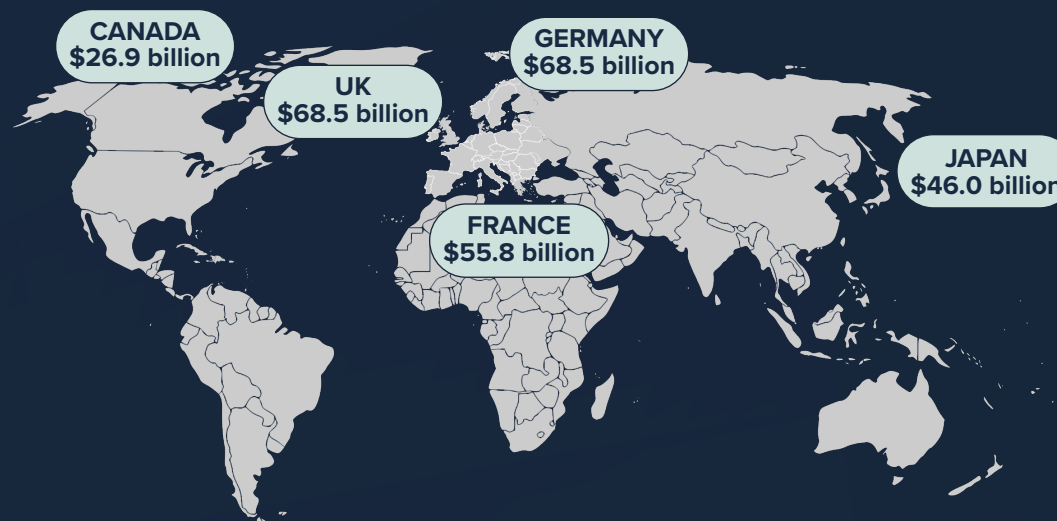
...And so much more

MARKET ANALYSIS

SERVICEABLE AVAILABLE MARKET (SAM)

Military spending in the US reached \$877 billion in 2022.

US Allies spend closer to ~1.1278 trillion, or close to 50% of the total addressable market.



TOTAL ADDRESSABLE MARKET (TAM)

The total addressable market in 2023 is \$2.24 trillion based on world military spending growing (for the eighth consecutive year) in 2022 to an all-time high of \$2.24 trillion

By focusing on the specific area within TAM and SAM where Arcflash operates, namely innovation and R&D spending, we identify a significant opportunity. The U.S. alone allocated \$34 billion of its \$877 billion national-security budget for 2022 to this niche.

Assuming a comparable percentage (~4%) of spending on innovation across U.S. allies, we pinpoint the serviceable obtainable market at approximately \$45.112 billion.

MARKET ANALYSIS

MARKET SPECIFICS

The U.S. defense industry is highly consolidated, with major vendors controlling most of the market, leading to high markups and slow innovation. New players can emerge with quick solutions at lower costs.

<https://www.generalist.com/briefing/anduril#market-prime-time>

WHY NOW?

A record R&D request in the 2022 DOD budget and growing investor interest in defense startups (\$8 billion in 2021, up from \$1.4 billion in 2018) make it a prime time to enter the market.

<https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/how-will-us-funding-for-defense-technology-innovation-evolve>

MARKET GROWTH

U.S. defense spending is predicted to grow from \$746 billion in 2023 to \$1.1 trillion by 2033. The market size is expected to grow at a CAGR of 0.67% to reach \$646.83 billion by 2031.

<https://www.statista.com/statistics/262742/countries-with-the-highest-military-spending/>

CUSTOMERS

As the primary market for Arcflash Labs, the U.S. accounts for 39% of global military spending, three times more than China (the second-largest spender). This massive investment is indicative of a strong willingness to pay.

<https://www2.deloitte.com/content/dam/Deloitte/us/Documents/manufacturing/us-eri-outlooks-2022-aerospace-defense.pdf>

COMPETITION

CHINA

- Handheld coil guns and railguns adapted for Air Force.
- Actively testing handheld variants; includes naval, land, and small arms applications.
- Challenges include high energy requirements, excessive heat, and premature wear.
- Chinese advancements include magnetized plasma artillery, small arms railguns, and naval railguns.
- Ship-Mounted Railgun operational since 2018, tested at sea, 250 km range, 2,575 m/s velocity.
- Magnetized plasma artillery, rifle and pistol-size railguns, increased range and penetrating power.



<https://asiatimes.com/2022/02/chinas-railgun-tech-on-a-surprising-fast-track/>

RUSSIA

- **Railgun Prototype:** 3 km per second projectile speed, potential to tear through any armor.
- **Potential Applications:** Military artillery, space cargo transportation to the International Space Station (ISS).
- **Projectile Characteristics:** 7,200 mph speed, 15-gram plastic cylinder, ability to cut through thick aluminum.



<https://futurism.com/dasvidaniya-russia-successfully-tests-new-weapon-that-can-blow-away-any-type-of-armor>

COMPETITIVE ADVANTAGE

R&D OPPORTUNITY:

Adapt handheld pulse power coil guns and rail guns for Air Force.

INNOVATION & EFFICIENCY:

No moving parts, easy cleaning, adjustable power, silent operation.

PATENTED INVERTER TECHNOLOGY:

Achieves higher power and higher rate of fire.

SUPERIOR ENERGY DENSITY:

Battery exceeds same-size firearm ammunition, outpacing most PCP Air Rifles in muzzle energy.

FUTURE DISRUPTION POTENTIAL:

Investment will accelerate parity with conventional firearms. Major disruption to the defense industry once energy density reaches parity.

In the U.S., railgun development has been halted to focus on **hypersonic weapons and lasers**. Despite a successful land test in 2017, challenges like short barrel life and limited range led the Navy to pause this work. Instead, **the U.S. is advancing laser technology** that offers immediate hits, precise targeting, and low shot costs.

The U.S. must continue research and development in this area to remain competitive and retain a battlefield edge. **Arcflash Labs, with its innovative and patented technology, stands at the forefront of this effort, promising transformative changes in the defense sector.**

BUSINESS MODEL

Our main revenue streams will be sourced from large multi-year defense contracts, focusing on contracts with the Department of Defense, Department of the Air Force, other U.S. military branches, and allied forces.

Our dramatically increased product development speed compared to incumbents allows us to leverage a penetration-based pricing strategy.



Our revenue-generating products include accelerators & magazines (fully assembled guns) and armatures. We also offer integration with accompanying products like UAVs (Unmanned Aerial Vehicles) and automated robot systems.

Our agility enables us to be flexible on margins to gain a foothold in the market. This is evidenced by our success in the direct-to-consumer side of our business, where we have demonstrated adaptability and responsiveness to market needs.

Seeking \$5M Seed Round Equity Partners

TO ACCELERATE GROWTH AND ACHIEVE LARGE SCALE PRODUCTION

USE OF FUNDS



Environment Ruggedization:

- Enhance resilience to dirt, drops, and damage in various deployed settings, along with sustained functionality in cold temperatures, frost, snow, and precipitation.



Automated Robot Systems:

- Engineer the technology to be compatible with UAVs (Unmanned Aerial Vehicles) and automated robot systems in use across the DAF (Department of the Air Force).



Scaling Power:

- Increase the power development of EM guns to ensure that they exceed or match conventional firearms in terms of energy density and rate of fire.



Protection

- Gain patent protection for our innovative spin stabilization technology, as well as other core intellectual property (IP) integral to our products.



DoD Support

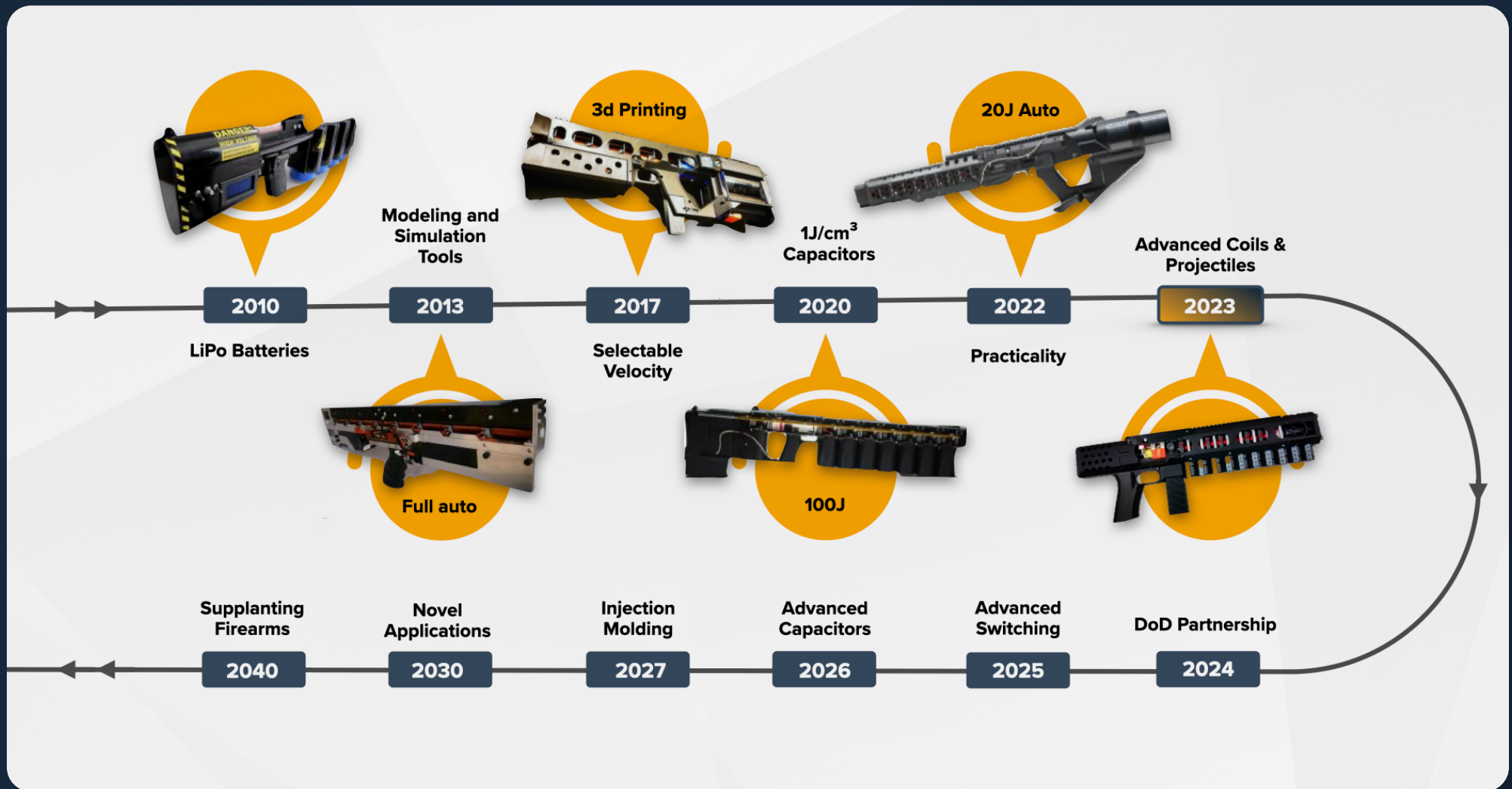
- Writing a grant proposal to compete for funding through the U.S. Department of Defense's Small Business Innovation Research (SBIR) program, specifically the D2P2 award.



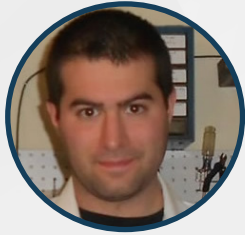
Increased Production

- Establish an industrial manufacturing facility in Arizona to significantly scale up production capacity, aligning with a corporate conversion to an Arizona C Corporation.

PRODUCTION TIMELINE



LEADERSHIP TEAM



Dr. David Wirth

CEO

- PhD in **NanoEngineering** (UCSD).
- Forbes *30 Under 30*, Manufacturing (2018).
- **10+ years** in R&D, additive manufacturing, materials science, propulsion, high power electronics.
- 500+ citations, 9 patents, inventor of the portable railgun.
- Former USAF Engineering Officer, founder at Fabric8Labs, inventor of ECAM.



Jason Murray

CTO

- BS in **Aerospace Engineering** (UCI)
- Project Management certification (Caltech).
- **10+ years** in systems design, advanced spacecraft propulsion, electromagnetics.
- Former USAF Engineering Officer, lead roles at Millenium Space Systems, Northrup Grumman, and senior power systems engineer at SpaceX for Starship.



Jack Lovley

COO

- BS in **Business Management** (National University).
- 5+ years in **manufacturing engineering, R&D, reliability engineering**.
- **Led engineering** at Safran Aerospace, supervised 4 direct reports, led product lines at Arcflash Labs.
- Reliability engineering on high voltage capacitor charging **power supplies**.



Luca Battaglia

CMO



Jesse Richard

DESIGN ENGINEER



David Woll

BUSINESS ADVISOR



Steven Talens

CINEMATOGRAPHER



Lucas von Hollen

TECHNO WIZARD

APPLICATIONS

CIVILIAN DEFENSE

The potential applications of our technology in the realm of civilian defense are vast. Our weapons, using loose tolerance ammunition, are not only economical but also ensure higher accuracy with significantly reduced recoil, providing a more user-friendly and effective personal defense tool.

Additionally, our advanced electromagnetic rifled ammunition, designed with tight geometric tolerances, offers unprecedented accuracy, bolstering their appeal for personal defense applications.

The Global Civilian Less Lethal and Self Defense Weapons Market Size was estimated at USD 58.00 million in 2022 and is projected to reach USD 68.01 million by 2029, exhibiting a CAGR of 2.30% during the forecast period.

Source: <https://www.marketresearch.com/Bosson-Research-v4252/Global-Civilian-Less-Lethal-Self-3425310/>

LAW ENFORCEMENT

Our technology has significant implications for non-lethal crowd control. Our electromagnetic weapons can be calibrated to non-lethal energy levels, offering a safer and more humane means of crowd control.

These devices are also capable of firing rubber ammunition, providing law enforcement with a versatile tool for diverse operational needs.

The non-lethal weapons market is forecasted to reach \$9.6 billion by 2026, underscoring demand for versatile, variable-lethality options.

<https://finance.yahoo.com/news/non-lethal-weapons-market-size-142800059.html>

DEPT. OF DEFENSE

Our electromagnetic weapons can serve as effective counter-UAS (Unmanned Aerial System) or anti-material weapons.

They can fire armatures at high speeds from compact form factors and maintain energy levels that limit collateral damage. Coupled with semi-autonomous computer-controlled targeting systems, they present a potent solution for combating drone threats.

The United States Defense Market size is expected to grow from USD 625.59 billion in 2023 to USD 646.83 billion by 2031, at a CAGR of 0.67% during the forecast period (2023-2031).

<https://www.mordorintelligence.com/industry-reports/united-states-defense-market>

A photograph of two men, Jason Murray and David Wirth, standing side-by-side. They are both wearing blue button-down shirts and name tags. Jason Murray, on the left, is holding a high-voltage probe with a yellow and black striped label that says "DANGER! HIGH VOLTAGE". David Wirth, on the right, is also holding a similar high-voltage probe. The background is a plain, light-colored wall. The entire image is overlaid with a semi-transparent blue filter.

FOR MORE INFORMATION, CONTACT:

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