

CONCEPT REPORT

PROJECT : Sky-Astra ADP (Anti-Drone Projectile)

Core Technology: Auto-Expanding Metal Structure (on R&D)

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Note:

This concept report comes under **Project Sky-Astra** of **Eleven String Pvt. Ltd.** The aim of this project is to invent new technologies, systems, and inventions for drone warfare. Under Project Sky-Astra, our objective is to develop multiple solutions such as **SkyAstra ADP, ADC, ADG, ADR, and ADS**, among others.

Additional Project Vision:

Alongside Project Sky-Astra, **Eleven String Pvt. Ltd.** is also conceptualizing and evaluating multiple parallel innovation projects such as **Wari-Astra** (*Wari – a synonym for water*), **Sky-Rath**, **Jal-Rath**, **SkyHunt**, and other future platforms. Each project is designed as an independent innovation framework, enabling the development of multiple inventions, technologies, and defence systems under a single project ecosystem across **air, land, and water domains**.

This multi-project strategy allows structured research, focused invention, and scalable development of next-generation defence and security solutions.

Now:

Now, let us take a deep dive into the **SkyAstra ADP (Anti-Drone Projectile)** concept report to understand the technical foundation, working principle, operational advantages, and potential applications of this invention in modern drone warfare scenarios.

ABSTRACT

SkyAstra ADP (Anti-Drone Projectile) is an innovative gun-deployable anti-drone system designed to neutralize hostile drones instantly using a purely mechanical expansion mechanism. The projectile uses a unique **Auto-Expanding Metal Structure** that unfolds into a wide entanglement web as soon as it is fired. This design eliminates the need for electronics, specialized launchers, or heavy equipment, making the system easy to use, low-cost, and rapidly deployable.

The projectile expands mid-air, increasing hit probability by 300–400%, and entangles the drone's propellers, causing immediate loss of lift and control. SkyAstra ADP works with existing weapons (rifle, pistol, carbine, LMG), making it the first scalable gun-fired anti-drone solution suitable for Army, Navy, Air Force, Police, and CAPFs.

With rising drone threats across borders, airports, defense bases, and public events, SkyAstra ADP offers a high-impact, low-cost, export-ready solution with strong patentability and massive global market potential.

1. INTRODUCTION

Drones have rapidly transitioned from hobby devices to serious security threats capable of delivering explosives, smuggling contraband, conducting surveillance, disrupting public events, and breaching military airspace. Their small size, high maneuverability, and low radar signature make them difficult to track and neutralize.

Existing counter-drone solutions—including RF jammers, anti-drone guns, and laser systems—are expensive, bulky, require skilled operators, and often fail in high-speed or close-range situations. Many are ineffective in dense urban environments or high-interference zones.

SkyAstra ADP addresses these limitations by introducing a new category of solution: a **gun-fired mechanical anti-drone projectile** that expands into a large entanglement disc instantly after firing. It requires no new equipment, no training, and no electronics—only a standard firearm.

This makes SkyAstra ADP the most affordable, deployable, and scalable anti-drone solution for frontline forces.

2. PROBLEM STATEMENT

Small drones pose major threats to the Police, Army, Navy, Air Force, BSF, CRPF, CISF, ITBP, SSB, and critical infrastructure.

Common threats include:

- Terrorist payload delivery
- Smuggling across borders
- Surveillance & spying
- Airbase intrusion
- Public event disruption
- Weaponized drone attacks

Current anti-drone systems have several limitations:

- Expensive and difficult to deploy
- Heavy and bulky equipment
- Require trained operators
- Affected by weather and signal interference
- Ineffective in close-range or sudden attacks

There is **no low-cost, simple, gun-fired anti-drone system** available for instant use.

3. ROOT CAUSE OF THE PROBLEM

Anti-drone systems fail because:

- They rely on electronics (RF/GPS jamming)
- They need special launchers and large equipment
- They are not portable
- They are slow to operate in emergencies
- They cannot be deployed by every soldier or police officer
- They are too expensive for mass usage

There is no **mechanical, instant, gun-based** solution in the market.

4. PROPOSED INVENTION — SkyAstra ADP (Anti-Drone Projectile)

SkyAstra ADP is a gun-fired projectile that uses an **Auto-Expanding Metal Structure** to unfold into a high-speed entanglement web after firing.

Key Advantages:

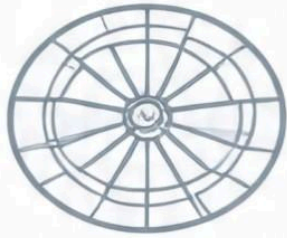
- ✓ Works with existing guns (rifle, pistol, carbine, LMG)
- ✓ Zero electronics
- ✓ No special training
- ✓ Low cost & lightweight
- ✓ Fastest deployable anti-drone system
- ✓ Effective at short, mid, and long range

This invention adds a new capability to all security forces:

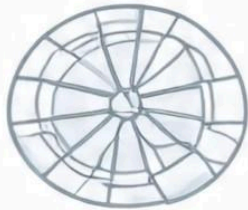
Fire → Expand → Disable Drone.



Pre-Fire State



Auto-Expanding



IkyAsttra ADP
Progactle T. R. M. C. Technical



Disable/Destroy Drone

5. WORKING PRINCIPLE (Simple Explanation)

1. The projectile is fired normally from any gun.
2. The firing conditions trigger the Auto-Expanding Metal Structure.
3. The projectile unfolds into a wide rotating capture-web.
4. The web entangles the drone's propellers.
5. The drone loses stability and falls immediately.

Because the web expands, **accuracy increases by 300–400%**, meaning direct hit is not required.

6. INNOVATION & NOVELTY

This invention is unique because it is the **first gun-fired anti-drone entanglement system**.

Novel aspects include:

- Self-expanding mechanical deployment
- No batteries, electronics, or signals
- Works in all weather conditions
- Ultra-low production cost
- Highly portable & mass scalable
- Auto-expanding metal design

No existing anti-drone product provides this combination of **simplicity + speed + scalability**.

7. TARGET MARKET & OPPORTUNITY

Primary Customers:

- Indian Army
- Indian Navy
- Indian Air Force
- Indian Police Forces
- BSF, CRPF, CISF, ITBP, SSB
- Airport security units
- Special Forces
- Critical infrastructure (ports, dams, refineries, data centers)

Market Size:

- Global Anti-Drone Market: ~₹80,000 crore
- India Anti-Drone Procurement (2024–2030): ~₹9,000 crore
- Drone threat incidents increasing YOY

SkyAstra fits perfectly into a market demanding **affordable & rapid deployment solutions**.

8. BUSINESS POTENTIAL

Revenue Opportunities:

- Defence procurement contracts
- Police and CAPF bulk orders
- Exports to friendly nations

- Licensing to weapon manufacturers
- Royalty-based deals
- Training kits & accessories

High demand × Low cost × Mass usage = Strong business model

9. PROTOTYPE FEASIBILITY (High-Level & Safe)

Prototype includes:

- Auto-expanding metal structure model
- Capture-web mechanism
- Deployment tests
- Inert firing trials
- Field tests (authorized agencies only)

Prototype Time: 1–2 months

Prototype Cost: Low

(No harmful technical details disclosed.)

10. REVENUE MODEL

- Projectile sales to defence & police
- Licensing & co-manufacturing
- Export deals
- Annual replacement orders
- Training & demo kits

11. RISKS & MITIGATION

Risk: Drones move unpredictably

Mitigation: Multiple expansion sizes; wide capture radius

Risk: Manufacturing precision

Mitigation: CNC forming, advanced QC

Risk: Regulatory approvals

Mitigation: Supply only to authorized agencies

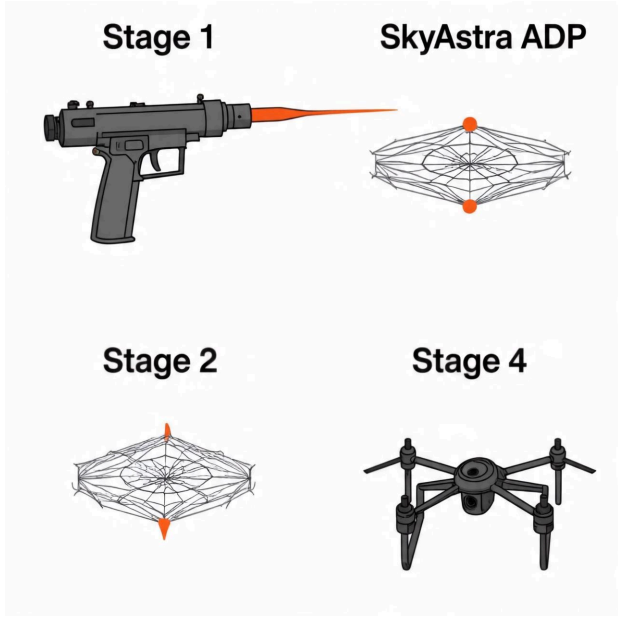
12. CONCLUSION

SkyAstra ADP provides a revolutionary approach to drone neutralization by combining **mechanical simplicity**, **gun-based deployment**, and **instant disabling capability**. Its Auto-Expanding Metal Structure makes it fast, reliable, and scalable—ideal for the Indian defence ecosystem and global export markets.

This technology makes drone neutralization:

- Faster
- Safer
- Cheaper
- Easier
- Mass-deployable

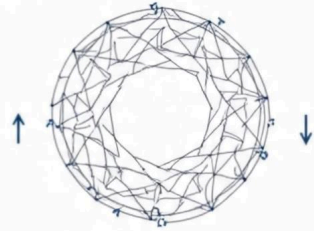
With high commercial potential and strong patentability, SkyAstra ADP has the power to become a frontline standard for anti-drone operations.



Before Firing - Compact Projectile



**Projectile Expands into
Capture-Web Disc**



Stle33



Drone Entanglement -



**Ireaement - Immediate
Neutralization**

