RAKI INDUSTRIES INDIA PVT. LTD

Raki Industries India is an Indian Company dealing in supply of Spare parts and Main unit assembles of Russian equipment being held by the Land forces and now diversified into manufacturing of unmanned Aerial vehicles in particular with all types of weaponized drones. The company is recognized and licensed by Ministry of Commerce, Government of India and has a Defence Manufacturing License for production of UAVs.

RAKI INDUSTRIES INDIA PVT. LTD

- Défense License Certified- to undertake manufacturing of all types of UAVs
- Startup – DIPP
- MSME / NSIC
- ISO: 9001:2015
- MOU with TCL, OEFHz, other startups
- MOU with IIT, Delhi
- Seeking Incubator facility at IIT Delhi (Under submission)
- Experience – Execution of Defence Supply orders

NECESSITY OF WEAPON MOUNTED DRONES

- **Reduced Risk to Personnel**: The primary military advantage is the ability to conduct dangerous missions and precision strikes against high-value targets without risking the lives of pilots or ground forces.
- **Precision Strikes**: Armed drones are designed to deliver guided munitions with exceptional accuracy, which proponents argue minimizes collateral damage and civilian casualties compared to other forms of military force like large-scale aerial bombing.
- **Persistent Surveillance and Rapid Response**: Drones can "loiter" over a target area for hours or even days, providing real-time intelligence, surveillance, and reconnaissance (ISR). This persistent presence allows for immediate responses to emerging threats, reducing the time required for traditional air support mobilization.
- **Cost-Effectiveness and Versatility**: Combat drones are significantly less expensive to acquire and operate than manned fighter jets, making sophisticated airpower more accessible to a wider range of nations. They can also be quickly reconfigured for various roles, from electronic warfare to logistical supply drops.
- **Access to Inaccessible Areas**: Drones can operate effectively in remote, rugged, or heavily defended airspace that would be too dangerous or logistically challenging for manned aircraft or ground troops

In conclusion, while weaponized drones offer undeniable tactical and strategic advantages in modern warfare and security operations.

Industrial License : Raki Industries

Defence **By Speed Post**

भारत सरकार /Government of India
वाणिज्य एवं उद्योग मंत्रालय /Ministry of Commerce & Industry
उद्योग संवर्धन और आंतरिक व्यापार विभाग / Deptt. for Promotion of Industry & Internal Trade
(औद्योगिक अनुज्ञप्ति अनुभाग/ Industrial Licensing Section)

DIL:16(2022)

Udyog Bhawan, New Delhi,
Dated; 19th September, 2022

To,

M/s. Raki Industries India Pvt. Ltd.
C-307, Plot-18, Shakti Complex,
Sector-5, Dwarka, Delhi-110075

Subject:- Application for Grant of Industrial License from M/s. Raki Industries India Pvt. Ltd. for manufacture of Unmanned Aerial Vehicles under Scheduled Industry No. 37 (Defence Sector).

Ref.:- Application No. 57/IDR/2021-IL dated 20.12.2021

Sir,

Application No. 57/IDR/2021-IL dated 20.12.2021 for an Industrial License, having been received under Rule 7 of the Registration and Licensing of Industrial Undertakings Rules, 1952 from M/s. Raki Industries India Pvt. Ltd., for establishing a new industrial undertaking for manufacture of items mentioned in the subject cited above, the Central Government in exercise of the powers conferred on them under Rule 15 of the said Rules, hereby grants this License to M/s. Raki Industries India Pvt. Ltd. for manufacture of the following item(s) and subject to the following conditions:

S. No.	Name of the Item(s)
1.	**Unmanned Aerial Vehicles specially designed for military application**

2. The new Industrial undertaking to manufacture above mentioned items shall be located at **222, Phase IV, Udyog Vihar, Gurgaon (Gurugram), Haryana-122015.**

3. The new Industrial undertaking shall be completed and commercial production established within a period of Fifteen years from the date of issue of this Industrial License.

PROJECT-1

Weapon MAG-7.62 X51MM Gun Mounted Drone

MAG 7.62X51MM-WEAPON MOUNTED DRONE : RAKI

Project Objective

To design, develop and prototype a rotorcraft-based weapon system capable of

– carrying a 30 Kg payload (including weapon and ammunition system)

-Flying for a minimum 30 min

-offering stabilized remote firing of MMG

-Supporting Long Range (10 Km) secure communication

-Enabling precision targeting and advanced fire control through indigenous software

The proposed system consists of the major components

– Battery Operated

-Gun Stabilizing system (GSS)

-Fire control Hardware & Software -

-Ground control system with secure Radio Link

-Integrated camera for target acquisition.

The weaponized drone should able to operate at High Altitude Locations.

- important ability to detect and destroy the target in advance in integrated land vehicle security operations

SYSTEMS : MANFACTURING OF WEAPONIZED MMG DRONE

1. GUN SUSTEM
2. DRONE DEVELOPMENT SYSTEM- BATTERY POWERED
3. GUN STABILIZING SYSTEM (INTEGRATION PLATFORM, RECOIL MANAGEMENT AND VIBRATION MANAGEMENT
4. DRONE FIRE CONTROL HARDWARE AND SOFTWARE SYSTEM AND INTEGRATED CAMERA FOR TARGET ACQUISITION
5. GUN MOUNTING SYSTEM
6. GROUND CONTROL SYSTEM
7. AMMUNITION
8. ASSEMBLY AND INTEGRATION
9. PROOF TESTING
10. INTERNAL FIRING AND TESTING
11. EXTERNAL FIRING

PROJECT-2

MULTI GRENADE LAUNCHER(MGL): WEAPONIZED DRONE

MGL (MULTI GRENADE LAUNCHER) MOUNTED DRONE

PROBLEM: ORGANIC COST-TO KILL RATION AS WELL AS TACTCIAL AND OPERATIONAL ADVANTAGE OF MGL MOUNTED WEAPONIZED DRONE. Our MGL Mounted drone is highly effective and can perform close air support, surveillance, and target neutralization during Tactical Military and security operations.

1. Lack of smart targeting solutions on unmanned systems
2. High cost platform with attributable systems (i.e.. One way attacking loitering munitions
3. Modular
4. weapons for robotic application to achieve true scalability and lethal mass
5. The weapon systems feature a stabilization mechanism to counteract recoil during firing.

1. System	Cost per unit	MIL safety Approved	Est. Time to Restock
UKR FPV Drone	$1000 /-	No	2-3 days
Switch Blade	$60,000/-	Yes	1-2 weeks
40mm Grenade	$50	Yes	1-2 days

MULTI-COPTERS HAVE RESTRICTED ENDURANCE WITH ABERRATION OF COUNTERING THE RECOIL FORCE. THIS RULES OUT ALL LONG-RANGE MISSIONS. MULTI-COPTERS ALSO HAVE A COMPLICATED, HEAVY, EXPENSIVE CAMERA GIMBAL, THAT DOES NOT ALLOW THE USER TO LOOK UPWARDS. LOW RELIABILITY OF ACCURATE FIRING

FIXED WING DRONES HAVE THE RANGE AND ENDURANCE REQUIRED FOR LOG RANGED MISSIONS, BUT LACK THE EASE OF VERTICAL TAKE-OFF AND LANDING WITH WEAPON MOUNT AND CAN'T PERFORM MISSIONS REQUIRING CLOSE-IN HOVER, SUCH AS ENEMY POST OR TERRORIST HIDEOUTS .

Raki with collaboration of IIT Delhi, is developing a hybrid tilt-rotor drone that has unmatched hover capability and a high speed forward flight mode that allows four times the endurance of a standard quadcopter

Raki's Cerberus drone can hover at any pitch angle, a capability that removes the need for the camera gimbal. We also have advanced guidance laws that enable us to circle or face targets during fly-bys. We have our own flight computer and all software is custom built from scratch.

Our MGL Drone , which has a system capable of real-time image transmission; With its ability to perform simultaneous missions with a single or multiple drone system, it can perform many critical tasks such as detecting the target area, neutralizing the threat, post-operation damage detection and real-time image transmission.

The weapon systems feature a stabilization mechanism to counteract recoil during firing.

MGL - 40mm grenade launcher, a six-barrel revolving grenade launcher.

SPECIAL FEATURES: RAKI-MGL MOUNTED DRONE

1. The targeting system uses AI on the edge to automate parts of the fire control process.

2. All the operator has to do is tap on the identified target and hit the arm and fire buttons.

3. Whilst the Cerberus was designed for air to ground effects delivery, it is great to see the adaptability and flexibility of the system to be able to engage air targets. It was a very low drag development activity to hit static aerial targets."

4. Conventional weapons systems are designed for human-held operation. Raki's UxV Weapon Payloads are integrated onto unmanned vehicles (UxV), like the Cerberus MI UAV and to provide a remote weapon system capability with standard ammunition from robotic agents.

5. Designed and assembled in-house at IIT Delhi these UxV weapon payloads allow electronic firing, minimise weight and allows operators to select rounds remotely. Designed from the outset to incorporate robustness to weapon recoil and the intrinsic ability to aim a lethal payload without a weapon gimbal, Cerberus MI provides the war fighter an aerial robotic system equipped with modular kinetic and non-kinetic payloads.

6. Tactical units require a lethal sUAS that can operate in complex environments, with the capability of delivering organic strikes. Cerberus MI operates using standard military inventory ammunition and can be deployed by a single operator, whilst remaining man packable. When other ISR assets detect targets during dismounted or mounted operations, Cerberus MI would provide a precise engagement and reduce the reliance on large Close Air Support (CAS) assets, potentially minimising collateral damage.

SPECIAL FEATURES : RAKI MGL MOUNTED DRONE

7. Rapid into-action time Removeable arms, folding landing gears, and modular payload bay to facilitate quick into-action

8. Low cost per shot :- Re-usable and re-loadable with lethal or non-lethal payload configurations

9. AiTR & Tracking:- AI Target Recognition and Tracking onboard to support rapid engagement and lawful targeting

10. Ruggedized Connectors:- MIL-SPEC connectors for improved reliability and recoil survivability

11. Fire Controller:- Firing pin is misaligned with round until armed, plus Electronic Safe, Arm, and Fire and software protections

12. Simple UxV Integration :- Supply power and RS422 communications

13. Servo operated chambers- For round selection during operation

14. Versatile round loading:- Load different standard ammunition types for the same mission (lethal)

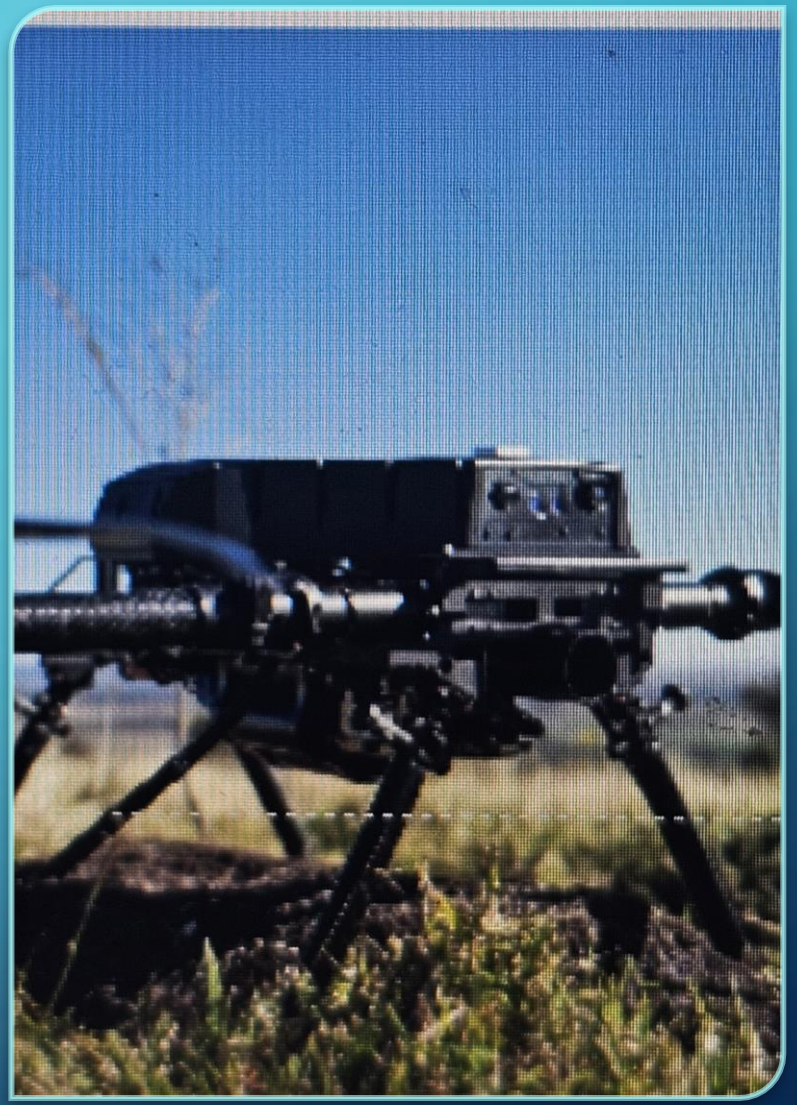
15. Raki's robotic systems: - Deliver precision robotic effects delivery at the tactical edge.

16 have a modular swappable ecosystem for common ground control, weapon systems and radios

service military with lethal.

CERBERUS MODULAR INTEGRATION LETHAL UAS

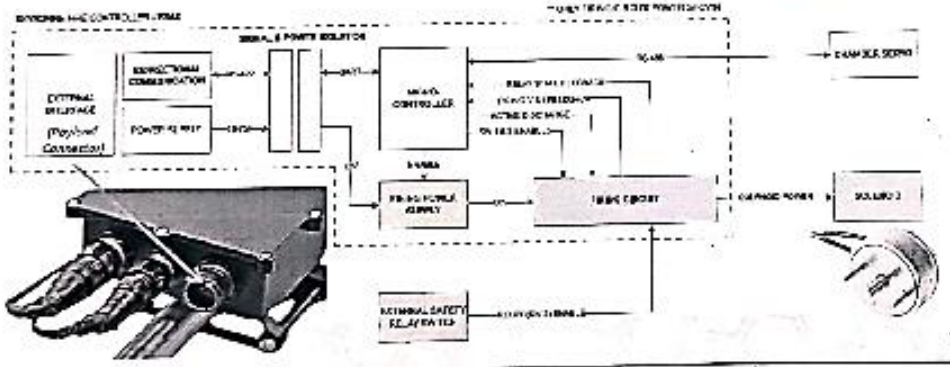
1. Man-Portable UAS with Lethal Mission modular Payloads
2. Standard Amn (40mm, 12GA) already in use Indian Defence as well as Para Military
3. Use cases- Direct Fire and Air-Air
4. MTOW- 25 Kgs
5. Weapon system- HAVOC 40mm & 12A
6. Man Packable
7. In to Action in 7 minutes
8. Payload Flexibility (Kinetic and Non Kinetic)
9. Recoil Robustness- Tactically Rugger sized and MIL specs Electronics and Connectors
10. Re-Usable and re-loadble
11. Battle Damage Assesment (Ability to do BDA during targeting
12. Aided Target Recognision –AI onboard to support lawful targeting
13. Low cost per shot (to compare Loitering munitions
14. Minimal Training



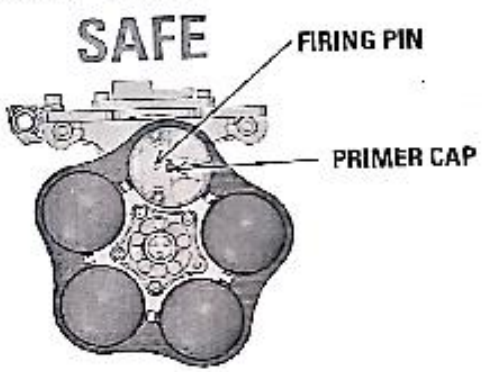
UxV Weapon Payloads

UxV Weapon Payload	CHAOS - 12GA Shotgun	HAVOC - 40mm Launcher	
Weight (unloaded & w/out SFC)	Aluminium 2.2 kg (4.85 lbs)	Carbon Fibre 1.6 kg (3.52 lbs)	Aluminium 2.5 kg (5.51 lbs)
Dimensions (mm)	L501 x W113 x H177	L682 x W131 x H136	
Ammunition Type	12 gauge (up to 75mm round length)	40mm Low Velocity (up to 134mm round length)	
No. of rounds	10	5	

Safety – Electrical



Safety – Mechanical



Skyhorse Fire Controller (SFC)	
Enclosure Material	Aluminium
Weight	0.9 kg (2 lbs)
Dimension (mm)	L135 x W135 x W52
Supply Voltage	Min. 18V - Max. 75V
Ingress Protection	IP66

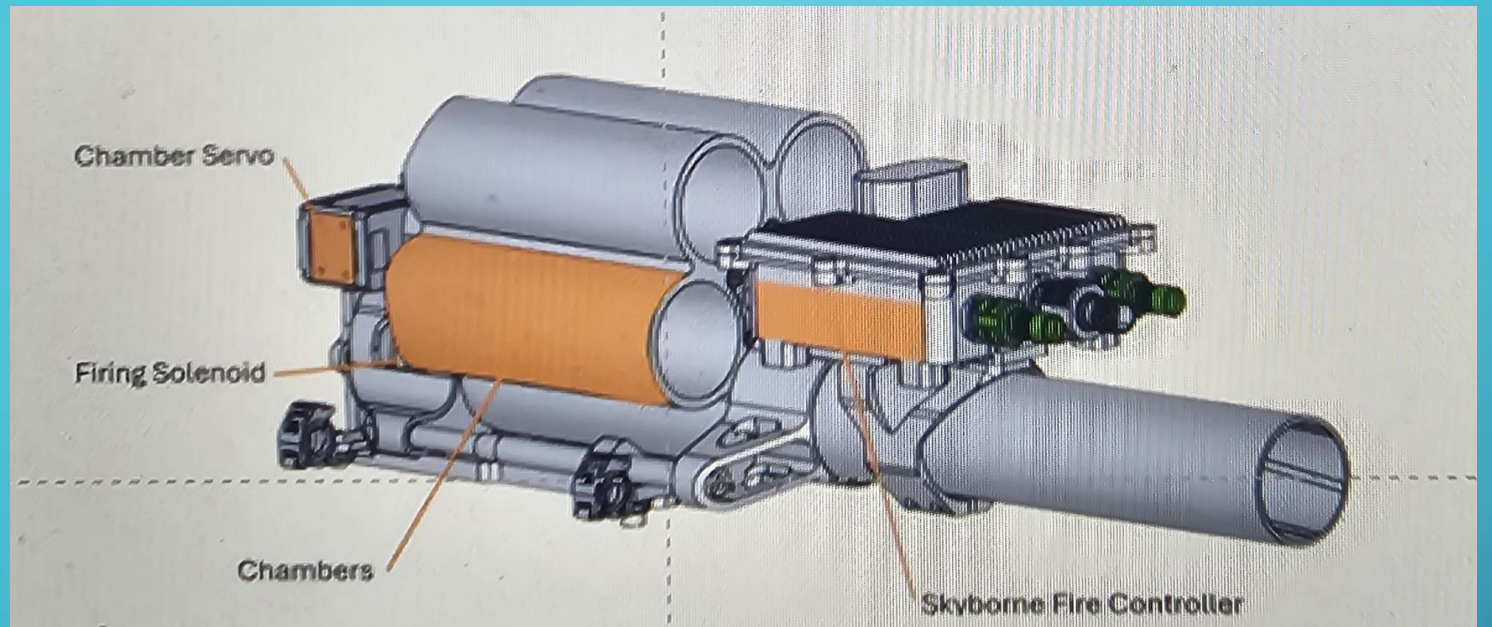


Figure 1 Weapon system overview

1 Key Features

- Easy integration for UxV applications – simple serial and power interface
- System designed to UK DEF STAN 59-114 – *Safety Principles for Electrical Circuits in Systems Incorporating Explosive Components*
- Versatile mechanical mounting options for weapons
- Lightweight – mass optimised for UxV applications (including optional carbon chamber for HAVOC)
- Versatile loading – load different ammunition types for the same mission (lethal or non-lethal)
- Intrinsically safe whilst unarmed – firing pin misaligned with chambered round and de-energised electronics
- Designed towards IP66 rating
- Operable in 60°C ambient temperature

The mechanical and electrical characteristics for the SFC are listed below.

Table 3 SFC Performance Specifications

SFC Specification	Value
Size (L x W x H) [mm]	150 x 117 x 58
Mass [kg]	0.61
Ingress Protection Rating [4]	IP66
Maximum Operating Ambient Temperature	60°C
Boot Time [s]	5
Supply Voltage [V_{min} – V_{max}]	18-75
Idle Power Consumption [W]	<0.5
Arming Power Consumption [W] (<1 second)	2.0
Chamber Rotation Power Consumption [W]	1.0
Host Communication Interface	Serial over RS-422
Firmware updates	OEM Only

[1] Radius of a circle within which 50% of rounds impact.

[2] M781, 40mm LV TP rounds with plastic casing have been observed to crack occasionally when exiting the barrel, this behaviour has not been seen with aluminium cased LV HEDP rounds.

[3] The CHAOS chamber has been designed to support 3” shells, however, testing has only been conducted on 2 3/4” shells.

[4] Yet to undergo certified testing

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THANK YOU