Nagastra-1

The **Nagastra-1** is an indigenously designed, portable unmanned aerial vehicle and loitering munition, developed by the Nagpur based private company Economic Explosives Limited in collaboration with Bengaluru based startup Z-Motion Autonomous Systems. It is intended to give the Indian Army a modern, lightweight, and adaptable system for asymmetric warfare, such as reconnaissance and precision strikes.[1]

Nagastra-1 can precisely locate, track, and destroy the target. It is used for concentrated attacks against single, authorized target while reducing collateral damage. With AI capabilities, Nagastra-1 can keep circling the skies until it locates its target. By delivering precise hits on enemy training camps, launch pads, and infiltration units, the Nagastra-1 lowers the risk for soldiers. As per the company, Nagastra-1 is made of over 75% indigenous content.[2][3][4]

History and development

The use of loitering munitions during the Nagorno-Karabakh conflict, the Red Sea crisis, the Russian invasion of Ukraine, and the Chinese acquisitions of suicide drones as well as the increase in drone-related incidents in India's border areas, particularly with Pakistan, prompted Economics Explosives Limited, a subsidiary of Solar Industries, to work with Indian startup Z-Motion Autonomous Systems to develop Nagastra-1 for the Indian Army.[5][6][7] Nagastra-1 is man-portable, electric powered fixed wing unmanned aerial vehicle/loitering munition. With a total weight of 30 kg divided between two backpack, the Nagastra-1 weapon system includes a payload, communication control, portable ground control station, and a pneumatic launcher. Nagastra-1 is based on Z Motion Autonomous Systems' Trinetra loitering munition. The UAV weighs 8–9 kg and has a 30-minute flight endurance time with two electric motors. With man-in-loop control, its range is 15 km, while in autonomous mode, it can reach 30–40 km.[8][1][9][10] The 30-minute flight endurance time has now been extended to 60 minutes.[11][12][13]

Nagastra warhead on display

Nagastra-1 carries 1-1.5 kg of high-explosive fragmentation warhead with surveillance cameras for day and night operation.[14] After taking off, Nagastra-1 can fly over a designated region and look for a suitable target. When the target is located, it dives at it and eliminates it. Nagastra-1 allows for quicker reaction times for moving targets. Due to the ability to modify or cancel attacks in mid-flight, more selective targeting is possible by faster response time against hidden targets. Because it uses an electric propulsion system, the UAV has a low sound signature, making it almost undetectable at heights above 200 meters. In kamikaze mode, Nagastra-1 can use GPS/NavIC satellite guidance to eliminate hostile threats with an accuracy of up to 2 meters CEP. Nagastra-1 has the ability to terminate its mission in midair and be recovered using a parachute recovery mechanism for use in future missions.[15][8][1]

Nagastra-1R

A 360-degree gimbal camera is part of the system, and for night missions, a thermal camera can be added. It also has a high-precision targeting system with a circular error probable

Nagastra-1	
	
Type	Unmanned aerial vehicle Loitering munition
Place of origin	India
Service history	
Used by	Indian Army
Wars	2025 India–Pakistan conflict
Production history	
Designer	Z-Motion Autonomous Systems Economic Explosives Limited
Manufacturer	Economic Explosives Limited
Produced	2024–current
Specifications	
Mass	8–9 kg (18–20 lb)
Warhead	High-explosive fragmentation

(CEP) of 2 meters, as well as proprietary encryption for safe video and telemetry transmissions. More than 80% of the system's parts are indigenous. Successful field tests have been conducted at Babina, and Ladakh.[16]

Warhead weight	1–1.5 kg (2.2–3.3 lb)
Engine	Electric motor
Operational range	30–40 km (19–25 mi)
Flight ceiling	>4,500 m (4.5 km) AMSL
Flight altitude	>200 m (660 ft) AGL
Accuracy	2 m (6 ft 7 in) CEP

Features

- Lightweight, portable and easy to carry the entire weapon system in two backpacks.[17]
- Precision strike capability in kamikaze mode.[4]
- Operation at high altitudes above 4,500 meters.[4]
- Cameras for day and night surveillance and a warhead for soft-skin targets.[4]
- Recall and reuse. A parachute-based mid-flight recovery system and a mission abort function for unidentified targets.[18][4][10]

Future development

Nagastra-3 on display

While the subsidiary company Economic Explosives Limited, began developmental works for the Nagastra-2 and Nagastra-3, more advanced variants of the platform with improved warhead carrying capacity and flying endurance. The design and development of a medium altitude long endurance class of drones has also been proposed by Solar Industries.[3] For man-in-loop control, the 12 kg Nagastra-2 carrying 2.2–4 kg anti-tank/anti-personnel warhead will have a range of more than 25 km and can hover over a target for 90 minutes. It is used against armored warfare targets.[19][20][10]

The Nagastra-3 is a component of Medium Range Precision Kill System. The Ministry of Defense has placed it under Project Sanction Order in the Make-I category of the Defense Acquisition Procedure 2020. The operational range and endurance of Nagastra-3 will be up to 100 km and more than 5 hours, respectively.[21]

Order

On 24 April 2023, Solar Industries announced that Economic Explosives Limited had defeated contenders from Poland's WB Electronics Warmate and Israel's UVision Air to secure a ₹212 crore contract with the Ministry of Defense for the provision of supplying loitering munitions.[22][23][14][24] Compared to similar airborne weaponry imported from Poland and Israel, Nagastra-1 is found 40% less expensive.[25]

As part of its ongoing efforts to improve precision-strike capabilities and update its artillery and infantry support systems, the Indian Army ordered 450 Nagastra-1R loitering munitions on 23 June 2025.[26][27]

Operators

The Indian Army confirmed the system's readiness for deployment by completing a pre-delivery inspection for the first batch of Nagastra-1 which consists of 120 units at Army Ammunition Depot in Pulgaon between 20–25 May 2024.[28][29]

- Indian Army: The initial batch of 120 units were delivered in June 2024.[30] Additional 480 units delivered in December 2024.[31]

Operational history

In order to acquire and engage targets during Operation Sindoor, the Indian Army employed Nagastra-1.[32]

See also

- WB Electronics Warmate
- UVision Air Hero
- AeroVironment Switchblade
- Raytheon Coyote

- ZALA Lancet

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