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India’s use of UAS in the May 2025 Pak-India flare-up:

A detailed visual breakdown on the different UAS and LMs used in the conflict.

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Introduction

Abbreviations used:

LM = Loitering Munition
WB = Working Boundary
IB = Indian Border
LOC = Line of Control
UAS = Unmanned Aerial System
AD = Air Defense
EW = Electronic Warfare
AAA = Anti aircraft artillery
UAS = Unmanned Aerial System
QC = Quad Copter

In the most recent flare-up of hostilities between India and Pakistan, the Indian Armed Forces demonstrated a notable shift in their operational tactics through the widespread use of **loitering munitions (LMs)**—a relatively new addition to the modern battlefield. These systems, often described as a hybrid between drones and cruise missiles, are designed to loiter over target areas for extended durations, conducting surveillance before autonomously or manually striking high-value or time-sensitive targets. This approach was intended to provide India with a **precision strike capability** that minimizes risk to personnel while offering real-time adaptability in dynamic combat environments.

The Indian Armed Forces adopted a distinctive doctrine in their use of loitering munitions (LMs) by having a "**mixed bag" approach**. The primary systems used in bulk appear to be the short-range Warmate, deployed by the Indian Army's **PARA-SF special forces** for tactical operations, and the long-range Harop, launched by the Indian Air Force (IAF) for strategic, deep-strike missions. In addition to these, demonstrating their unique mixed bag approach several other LMs from India's existing inventory were used in smaller numbers across various combat theaters ranging from Azad Kashmir in the north to Chor in the south. In total, as per our visual count at least **six types of loitering munitions and one armed UAV** were deployed, highlighting India's evolving integration of unmanned systems into both conventional and special operations.

However, while the doctrinal shift signaled an embrace of emerging warfare technologies, the **actual performance of the LMs was fairly poor**. According to open-source intelligence and preliminary battlefield assessments, a significant number of these loitering munitions failed to achieve their intended impact. Several LMs reportedly experienced **mid-flight failures, communication issues**, or **inaccurate GPS**, likely due to **electronic countermeasures (ECM)** employed by Pakistani forces while others were shot down by Pakistani AAA units.

Usage Pattern:

A Training Variant Warmate used a Decoy.

After evaluating the patterns of loitering munition (LM) usage during the recent conflict, it became evident that only two types the Warmate and Harop were employed in significant numbers. The Indian Army's PARA-SF units deployed Warmate LMs almost exclusively along the LOC and the WB, targeting civilian areas on the Pakistani side. However, a large portion of these munitions **either failed mid-flight, missed their intended targets, or were intercepted**. Many crashed into open fields, indicating effective use of electronic warfare. However a single Warmate Training Variant with Inert Warhead was also launched over Lahore with the aim of it **acting as a Decoy** to probe Low Level Air defenses in the area.

One particular instance, captured in a video released by the Indian government, shows a **Warmate LM** being launched toward a building across the LoC. The footage reveals the munition overshooting its target, suggesting a probable malfunction or error—either in the guidance software or manual control input. This example underscores broader concerns about the reliability and precision of these systems under operational conditions.

Meanwhile, the Indian Air Force (IAF) deployed Harop loitering munitions against nearly every Pakistan Air Force (PAF) airbase. However, due to Pakistan's extensive electronic warfare (EW) and air defense (AD) systems, these attacks were largely unsuccessful. Most of the Harops were either shot down or rendered inoperative due to EW interference, leading to crashes after their fuel was exhausted. Wreckage of downed Harops was recovered in areas deep inside Pakistan, including Attock, Rajanpur, and Malir, **indicating the wide dispersal and eventual failure of these high-end munitions**.

In addition to these primary systems, several other LMs were used in smaller numbers. For example, a Palm 400 loitering munition was reportedly launched at a potential target in Bahawalpur but crashed after launch. Two Banshee target drones, both dual-turbojet powered models, were used in the same Sheikhupura sector. These were likely **employed as decoys** to provoke or distract Pakistani air defenses, rather than for direct strikes.

The remaining LMs, along with a limited number of armed unmanned aerial systems (UAS), were deployed in operations concentrated along the LoC and WB, indicating a consistent focus on border engagement. Overall, while India's use of loitering munitions reflects an attempt to modernize its tactical capabilities, the high rate of failure—both in terms of operational effectiveness and technical performance—raises questions about the readiness, resilience, and strategic value of these systems in high-intensity conflict scenarios. Furthermore based on information from major Indian Defense news outlets it was claimed that IA had used atleast **3 different types of Munition dropping UAVs** along the LOC and WB. Use of Johnette JM-1 LM by Para-SF units was also claimed by India, however no wreckage has been found yet.

UAVs used in Operations by India during Escalation

UAS Name & Company Name	UAS Type	Visual Evidence of Wreckage	UAS Operator
IAI Harop	Loitering Munition	Yes	IAF
WB Group Warmate	Loitering Munition	Yes	IA
AVision Palm-120	Loitering Munition	Yes	IA
AVision Palm-400	Loitering Munition	Yes	IA
Elbit Sky Striker	Loitering Munition	Yes	IA
Solar EEL Nagastra-1/2	Loitering Munition	Yes	IA
Johnette JM-1	Loitering Munition	No	IA
QinetiQ Banshee Dual Engine	Target Drone (Decoy)	Yes	IA/IAF
IdeaForge Netra V4	Surveillance Quadcopter	Yes	IA
NewSpace Nimbus	Armed Quadcopter	No	IA
NewSpace Beluga	Armed Hexacopter	No	IA
Raphe Mphbir MR-10/20	Armed Hexa/Octacopter	Yes	IA
DJI Phantom 4	Surveillance Quadcopter	Yes	IA

Indian UAVs Wreckage Visually Identified

UAS Name & Company Name	UAS Type	Number shot down/wreckage found	UAS Operator	Region Used
IAI Harop	Loitering Munition	70+*	IAF	WB, IB & LOC
WB Group Warmate	Loitering Munition	11+	IA	WB & LOC
AVision Palm-120	Loitering Munition	1	IA	LOC
AVision Palm-400	Loitering Munition	1	IA	IB
Elbit Sky Striker	Loitering Munition	1	IA	WB
Solar EEL Nagastra-1/2	Loitering Munition	1	IA	LOC
QinetiQ Banshee Dual Engine	Target Drone (Decoy)	2	IA/IAF	IB
IdeaForge Netra V4	Surveillance Quadcopter	3	IA	WB & LOC
Raphe Mphbir MR-10/20	Armed Hexa/Octacopter	1	IA	LOC
DJI Phantom 4	Surveillance Quadcopter	1	IA	LOC

We have been able to visually identify at least **28 wreckages** of Harop loitering munitions (LMs) based on available visual evidence. However, due to their extensive deployment and the fact that almost all Harop LMs were subjected to electronic jamming, the actual number shot down is estimated to **exceed 70**. Given the large volume of these munitions and the challenges of locating and verifying every downed unit, it is not feasible to visually confirm each individual wreckage. Therefore, this report will focus only on a select number of major Harop wreckages that were recovered from deep within Pakistani territory.

Additionally following 2 Mini QCs were shot down using Soft-kill/Light arms fire methods by Pakistan on the LOC, after the cease fire was placed indicating that the Indian side had shifted towards using Mini QCs to evaluate BDA as the larger QCs would easily get spotted.

UAS Name & Company Name	UAS Type	Visual Evidence of Wreckage	UAS Operator
DJI Avata	Mini Quadcopter	Yes	IA
Hasakee Q10	Mini Quadcopter	Yes	IA

The visual count below contains wreckages of various Loitering Munitions used in Low numbers, Surverillance UAVs used in Low numbers and then subsequently Warmate and Harops wreckages.

Visual Count of UAS:

1. **AVISION PALM-120** (UVISION HERO 120) (Loitering Munition) **(x 1) (IA)**
Likely shot down by EW/AD. Recovered from Kotli Sector, Pakistan.

2. **AVISION PALM-400** (UVISION HERO 400) (Loitering Munition) **(x 1) (IA)**
Likely crashed after launch. Recovered from Sri Ganganagar Sector, India.

3. **Solar EEL Nagastra-1/2** (Loitering Munition) **(x 1) (IA)**
Likely shot down by EW/AD. Recovered from Bhimber Sector, Pakistan.


4. **Elbit Sky Striker** (Loitering Munition) **(x 1) (IA)**
Likely shot down by EW/AD. Recovered from Sialkot, Pakistan.


5. **QinetiQ Banshee** Dual Turbo Jet (High Speed Target Drone) **(x 2) (IA/IAF)**

5A. Likely shot down by EW. Recovered from Sheikhupura Sector, Pakistan.


5B. Likely shot down by EW. Also recovered from Sheikhupura Sector, Pakistan.


Both target drones were used as probable decoy baits for AD, but likely appear to have been crashed from EW interference.

6. **Raphe Mphbir MR10/20** (Armed UAS) **(x 1)**
Likely shot down by EW/AD. Recovered from LOC, Azad Kashmir, Pakistan.

7. **DJI Phantom** (Armed UAS) **(x 1)**
Likely shot down by EW/AD. Recovered from LOC, Azad Kashmir, Pakistan.

8. **Ideaforge Netra V4** (Surveillance UAS) **(x 3*)**

8A. Likely shot down by EW/AD. Recovered from LOC, Azad Kashmir, Pakistan.

8B. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

8C. * Footage had emerged of Pakistan Rangers and civilians shooting down a Low flying Netra V4 near Lahore that likely already been jammed. While no images of its wreckage were released, it is likely a confirmed kill.

9. **WB Warmate** (Armed UAS) **(x 1)**

9A. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9B. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9C. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9D. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9E. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9F. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9G. Likely shot down by EW/AD. Recovered from Sialkot Sector, Pakistan.

9H. Likely shot down by EW/AD. Recovered from Barnala (Bhimber) Sector, Pakistan.

9I. Likely shot down by EW/AD. Recovered from Shakargarh Sector, Pakistan.

9J. Likely shot down by EW/AD. Recovered from Attock Sector, Pakistan.

9K. Inert Variant likely shot down by EW. Recovered from Lahore Sector, Pakistan.

10. **IAI HAROP** (Armed UAS) **(x 70+)**

10A. Likely shot down by EW/AD. Recovered from UmerKot Sector, Pakistan.

10B. Likely shot down by EW/AD. Recovered from Lahore Sector, Pakistan.

10C. Likely shot down by EW/AD. Recovered from Rajanpur Sector, Pakistan.

10D. Likely shot down by EW/AD. Recovered from Karachi Sector, Pakistan.

10E. Likely shot down by EW/AD. Recovered from Gujranawala Sector, Pakistan.

11. **DJI Avata** (Mini Quadcopter) **(x 1) (IA)**
Likely shot down by EW/Light arms fire. Recovered from LOC, Pakistan after cease fire on May 28th.

11. **Hasakee Q10** (Mini Quadcopter) **(x 1) (IA)**
Likely shot down by EW. Recovered from LOC, Pakistan after cease fire on May 24th.

Final Thoughts

While India did extensively launch UAS and Loitering Munitions, most of these failed due to the dense EW Layer present inside Pakistan, a large numbers of LMs were directed at PAF Radar sites in a effort to conduct SEAD/DEAD Ops, however all LMs failed in this regards too. However this was not the case for several locations located on the LOC which due to the hilly terrain did not have dense EW coverage, rather both minimal AD & EW Coverage was there which lefts gap which IA took advantage off to hit civilian areas using Munition Dropping UAS and various Smaller Loitering Munitions. Furthermore after the cease fire was placed, India resorted towards using Mini-Quadcopters for ISR/BDA flights into Pakistani side.