

## *Jammu Drone Attack: Changing the Paradigm of Modern Warfare*

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## 1. INTRODUCTION

Jammu's drone attack on the IAF airbase in Jammu may have opened a new chapter, and not just in India's continuing tryst with terrorism. Instead, it could well mark a new chapter in warfare in this part of the world, imported as it has been from Syria and Iraq. "War", as we understand, is to gain high enemy destruction and low friendly casualties, and this can be true for any kind of warfare modern or ancient. From armies running into each other's to uses of canons to the introduction of aero planes during the World War 1 in 1914, improvements in technology have changed the course of warfare that was a common understanding and added a new sphere. The World Wars showed us the importance of air superiority, though it is Lufthansa's in London bombing or roaring Rolls Royce in the air as one of the biggest moral supports to ground troops. However, in the twenty-first century, air warfare has changed a lot with the changing technology, unmanned aerial vehicles, also known as drones, has taken up the front seat.

## 2. JAMMU DRONE ATTACK: AN EYE OPENER FOR SECURITY ESTABLISHMENT



Jammu Incident: Immediately after the drone-delivered improvised explosive devices (IEDs) were used to attack the Indian Air Force Station (AFS) at Jammu, in the early hours of 27 June, media circles were abuzz about this new asymmetric threat. The drone strike at the Indian Air Force (IAF) Jammu base followed by two drone sightings at Ratnuchak and Kaluchak military stations are clear indicators

that terrorists have upped the game and are using technology to remain one step ahead of the security forces. The use of drones by terrorists to target the IAF Jammu base marks a paradigm shift like the threat and countermeasures. Not only are vital assets and vital points vulnerable but so are military convoys.



**IAF STATEMENT:** An IAF statement reported “two low intensity explosions in the technical area of Jammu Air Force Station.” The statement is notable because the technical area of an air force station is where flying and other operational assets are housed—and is meant to be the most secure part of the station. Although Jammu is a relatively small base that normally hosts helicopters, not fighters or transports, it is in a sensitive part of the country, a mere 14 kilometre from the border with Pakistan, and is at least important enough to merit a runway expansion project scheduled for completion in 2021.



**CONCERNS:** While the IAF statement said that equipment at the base was unharmed and that only one of the blasts “caused minor damage to the roof of a building,” it is clear that the lack of destruction was entirely a matter of luck. Whether flying a pre-programmed path aided by satellite navigation and inertial measurement units (IMUs) or hand-controlled to the point of release or impact, both methods have significant limitations that likely played a part in the relatively light effects. Satellite and IMU navigation is prone to errors over even moderate flight ranges, while manual control is subject to the limitations of the line of sight, visibility and distance estimation of the target, and weak radio links. What is undeniable in all this is that the drones were not detected and managed to deliver explosives to the most secure enclave of an operational base. Future attacks might not be as ineffective.

## NEW PARADIGM

Of course, regardless of the nature of damage at Jammu AFS, the attack itself signals a paradigm shift that will have to be catered for. The Indian military will now undoubtedly go into an overdrive to secure sensitive locations against similar repeat attacks.

Early reports state that immediate plans are already underway at forward locations including deployment of “snipers, jammers, and other counter measures.” The need for an anti-drone system shielding critical installations in the country came under sharp focus after drone attack on an IAF base in Jammu, 14 km from the international border.

While the Jammu attack was the first such instance in India where a drone was weaponised, the most high-profile incident in recent times involving a drone, perhaps, was the targeted bombing of two key oil facilities inside Saudi Arabia by Yemen’s Houthi rebels in 2019.



INTERNATIONAL INCIDENTS: Drones have also been increasingly used in the Middle East, particularly in Iraq and Syria, by the US to carry out targeted assassinations. In 2020, Iranian general Qasem Soleimani, the most powerful figure in Iran after its supreme leader, was killed in a US drone strike in Iraq. In 2018, Venezuelan President Nicolas Maduro also claimed he survived an assassination attempt involving drones rigged with explosives.

### 3. DRONES: A TOOL OF TERROR

- ✚ The Association of the United States Army (AUSA) in February 2021 published a report titled, The Role of Drones in Future Terrorist Attacks.
- ✚ Here, the AUSA said the Islamic State made the first successful use of drones for terrorism.
- ✚ “Occasionally the group would strap an explosive onto a small drone and try to land it near a military outpost, as it happened in October when a booby-trapped toy aircraft exploded as Kurdish fighters were examining it near the northern Iraqi city of Irbil.”
- ✚ Earlier in 2013, Al-Qaeda attempted a terror attack using multiple drones in Pakistan without success. From 2016 on, the Islamic State made drone attacks a regular feature in its operations in Iraq and Syria.
- ✚ The threat was so serious that in 2019, European Union Security Commissioner Julian King warned that European cities could be targeted by terror groups using drones.
- ✚ Besides the Islamic State, the Hezbollah — active in Palestine and Lebanon, the Houthi rebels, the Taliban and several terror outfits in Pakistan is known to employ drones for terrorism.
- ✚ The threat of drone attacks from the Pakistani side is very real.
- ✚ Sighting of drones near the India-Pakistan border and the Line of Control (LoC) has been frequent. Some of them have carried weapons to the Indian side.
- ✚ In 2019, security personnel reported 167 sightings of drones from Pakistan, according to the official figures. In the pandemic hit 2020, there were 77 sightings.
- ✚ In Sep 2019, the Punjab Police had seized a drone-dropped arms consignment to bust a terror module, which was receiving supplies from Pakistan. The seizure included AK-47 rifles and China-made pistols.
- ✚ Another drone-dropped arms consignment was seized in Punjab’s Gurdaspur in June 2020. The same month, the Border Security Force (BSF) shot down a drone in the Hira Nagar sector of Jammu. The recoveries included the US-made M4 rifles.
- ✚ In Jan 2021, the Jammu and Kashmir Police caught two persons as they were picking up drone-dropped arms consignment.



## 4. ASYMMETRIC WAR AND THE URBAN PROBLEM



To make matters worse, some of the additional obstacles to defend against this threat are the result of old mistakes—either act of omission or commission. Significant urban encroachment around defence establishments, particularly airbases, has run rampant. Frontline bases like Jammu are surrounded by unbuffered civilian construction. Even important fighter stations, like the Rafale base at Ambala, have multi-storey buildings

overlooking the runway. In a 2019 incident, an IAF Jaguar pilot operating from Ambala was praised for saving civilians and his aircraft after suffering multiple bird strikes resulting in an engine failure. No mention was made of the fact that the bird activity was a result of the massive urban encroachment around the station, and that no civilian lives would have been in danger, to begin with, had zoning and construction norms been followed. In addition to providing vantage points for would-be attackers, urban encroachment provides precisely the sort of clutter that exacerbates the problem of drone detection. If not in the past, the issue certainly merits consideration now.

## 5. PREVENTING DRONE ATTACK



The path to comprehensively address this challenge, however, is far from straightforward. Electric multi-rotor type drones used in the attack are cheap and can be easily procured off the shelf or assembled using retail-level components. They are also incredibly difficult to detect. Their small size grants them weak radar, thermal, and aural signatures, albeit varying based on the materials used in their construction.



Detection difficulty is compounded when their size is coupled with low operating altitudes and slow speeds, making them harder to separate from clutter. The surveillance technology including radar systems that India has deployed at the borders or lines of control is meant for tracking bigger objects, helicopters, planes and missiles



Drones are smaller in size as small as 2 feet or only 60 cm than previously popular UAVs but can fly for several kilometres at a speed ranging from 125 kmph to over 950 kmph, according to the AUSA report. Preventing drone attacks requires jamming of drone systems and shooting them down. Laser-based Directed Energy Weapons (DEWs) are being talked about as a defence system against drone attacks.

Several private defence contractors, over the years, have begun to offer off-the-shelf anti-drone tech to counter hostile Unmanned Aerial Vehicles (UAVs), popularly known as drones. Companies, predominantly based out of Israel, the US, and even China, have developed anti-drone systems using existing technologies such as radars, frequency jammers, optic and thermal sensors etc. It comes down to the range and how the threat is assessed and neutralised. Some systems simply monitor and alert the presence of a drone, while others are equipped with ballistics and even lasers.

## 6. EXISTING DRONE SYSTEMS

Rafael, the defence company behind Israel's famed **Iron Dome missile system**, has also developed something called the Drone Dome. Like the Iron Dome, which identifies and intercepts incoming missiles, the Drone Dome detects and intercepts drones. Besides the collection of static radars, radio frequency sensors, and cameras it uses to offer "a 360-degree coverage", the Drone Dome is also capable of jamming the commands being sent to a hostile drone and blocking visuals, if any, that are being transmitted back to the drone operator. Its highlight, however, is the precision with which it can shoot high-powered laser beams to bring down targets. US-based Fortem Technologies also operates similarly but uses an interceptor drone — aptly called the 'DroneHunter' — to pursue and capture hostile drones. The DroneHunter fires from its 'NetGun' a spider web-shaped net to capture targets midair and tow them. Besides the regular detection and surveillance, DroneShield, an Australian publicly listed company, also offers a portable solution in the form of a drone gun that can be used to point and 'shoot'. The company's DroneGun Tactical and DroneGun MKIII engage in radio frequency disruption that will disrupt the hostile drone's video feed and force it to land on the spot or return to the operator.



**Cost:** Most of the leading players in the drone detection industry have not listed the prices of their products on their websites. Considering that most orders are customised based on client requirements and how many strategic sites need protecting, costs vary from hundreds of thousands of dollars to even millions. However, a 2020 press release by China-based DJI attacking one of its corporate rivals offers an insight into how much they may cost. The company said its rival offered "**a \$340,000 drone detection system with a \$44,000 annual maintenance fee**".

## IS THERE AN INDIGENOUS SOLUTION FOR INDIA?



Yes, there is. The Defence Research and Development Organisation (DRDO) has developed an 'Anti Drone System' and it will be deployed by end of 2021, according to a March press release by the Ministry of Defence. While details about the system's capabilities remain threadbare, it has been deployed during then US President Donald Trump's visit to India in 2020. The system was part of the security arrangements made for the 22km-long roadshow in Ahmedabad. The same year it was again used near the Red

Fort on the occasion of Prime Minister Narendra Modi's Independence Day address. The anti-drone system can detect, and jam drones up to 3km and uses a laser weapon to fire at targets that are 1 to 2.5km away.

## 7. DRONE REGULATIONS: 2.0 POLICY

The government has announced that it will soon come up with Drone Regulations 2.0 Policy. Key issues to be addressed there would include:



Certifications of sale and controlled operation of drone hardware and software **01**



Airspace management through automated operations linked into the overall airspace **02**



Beyond visual-line-of-sight operations **03**



Contribution to establishing global standards **04**

Drone policy 2.0 is a policy roadmap for establishing a fully functional drone ecosystem that would allow commercial usage of drones in India. The policy seeks to establish segregated airspace, namely the Drone Corridor, to keep commercial drone operations away from airspace where manned aircraft operate. This will be enabled through a UTM system, responsible for managing drone induced traffic. The policy also envisages laying down new principles for enhanced airworthiness requirements keeping in mind commercial operations that the drones may be engaged into. Apart from the inclusion of improved pilot training requirements, it also permits the use of algorithms for piloting a drone, by removing the compulsory requirement of a human remote pilot itself. However, such an autonomous drone will only be allowed, if the manufacturers of such drones can demonstrate the inclusion of principles such as safety, security and privacy in the design of the drone.

## 8. CONCLUSION



Finally, with or without complex anti-drone systems that cater to various use cases, intelligence on terror attacks using drones must also improve. When Pakistani drones were being used to supply weapons and ammunition to terror networks on Indian soil, these deliveries were routinely intercepted or at least stopped in action. Sales and transfers of commercial drones, or the hardware used to make basic multi-rotor drones are not easily monitored. However, as experience tackling the use of these methods by ISIS shows, intelligence, not defensive nets, are the most effective means of rapidly curtailing their use. Instead of detecting drones as they approach to attack, the most effective countermeasure is knowing when a bad actor first picks up a soldering iron and a circuit board.

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