

# M

# MILITARY SYSTEMS & Technology

[www.militarysystems-tech.com](http://www.militarysystems-tech.com)

The Defence Suppliers Directory Magazine

 **ST Engineering**



**Cover sponsored by – ST Engineering**

*ST Engineering develops the 120mm Ground Deployed Advanced Mortar System (GDAMS) to address modern battlefield needs for enhanced crew survivability.*

Edition Four | December 2024

# Next Gen Indirect Fires:

## Mortar Innovations for Modern Warfare

Modern warfare is undergoing a profound transformation, driven by rapid technological advancements and evolving geopolitical dynamics.

Traditional concepts of battlefield engagements are being redefined by the integration of cyber, space, and information warfare. The rise of drones, artificial intelligence, and autonomous systems has enabled nations to project power with unprecedented precision and minimal risk to personnel. This evolution has given rise to asymmetric warfare, where smaller states or non-state actors challenge larger militaries through cyberattacks, unmanned systems, and disinformation campaigns.

The emergence of hybrid warfare — blending conventional and irregular tactics—has blurred the lines between combatants and civilians. Disinformation and psychological operations are now pivotal, shaping public opinion and destabilising societies even before conflicts erupt. In this complex environment, military forces must become more agile and technologically adept, ready to operate in a multi-domain battlefield where the distinction between peace and war is increasingly tenuous. This shift underscores the urgent need for adaptable, cutting-edge solutions that prioritise speed, precision, and crew safety. Today, modern military operations demand systems that can deliver these capabilities at a moment's notice, making them indispensable to future combat strategies.

This technological advancement is actively driven by ST Engineering, a Singapore technology, defence and engineering organisation. With a focus on designing advanced defence and security solutions protecting cities and safeguarding citizens, ST Engineering has developed the Ground Deployed Advanced Mortar System (GDAMS) and the Super Rapid Advanced Mortar System (SRAMS MkII) to meet this growing demand.

### Rapid Deployment: The Need for Speed

Traditional mortar systems often require a "man-in-the-loop" for setup, deployment, and targeting, a process that leaves personnel exposed and vulnerable and slows the tempo of operations at critical moments. The solution lies in rapidly deployable, fully automated mobile mortar systems that can be mounted on vehicles tailored for evasive repositioning. In today's battle landscape, solutions that enable swift, automated deployment are no longer optional—they're essential.

Both SRAMS MkII and GDAMS are designed with "Shoot and Scoot" capabilities, allowing for rapid firing and repositioning, enabling crews to evade counter-battery fire — a critical asset in both offensive and defensive operations. GDAMS, can be deployed within 15 seconds and stow within 15 seconds, ensuring ultimate mobility and responsiveness to shifting battle conditions. This rapid deployment is currently unmatched in the current market and is key to maintaining a tactical advantage.

### Platform Agnostic

The combat proven 120mm SRAMS – the first mortar in the world with a recoil force of less than 30 tonnes when firing maximum charge to achieve a range of 10 km. The recoil system absorbs the firing force, reducing the strain on both the vehicle and the loading system, ensuring smoother operation. Weighing only 1,200 kg, it can be integrated onto and fired from onboard a wide range of light tracked or wheeled vehicle via a single electrical interface, bringing great firepower to the lowest echelon.

The GDAMS, in particular has excellent modular compatibility. It is compatible with the existing 81mm mortar barrel, thereby allowing for seamless integration with legacy systems while providing the enhanced firepower of a 120mm system. This modularity ensures flexibility in munitions and operational adaptability. The lightweight mortar design also allows for integration across multiple platforms, be it a lightweight commercial vehicle or a 4x4 military class wheeled vehicles, making it a versatile solution for various operational needs. ST Engineering leverages simulation technology to optimise the GDAMS, ensuring it can withstand the stresses of firing while maintaining a lightweight structure

for maximum ammunition capacity. This next-generation mortar system embodies the future of indirect fires, offering a platform that is agile, modular and supremely capable.

The platform-agnostic nature of both the SRAMS and GDAMS allows for easy integration with local partners and their indigenous Battlefield Management Systems (BMS). They are also fully integrated with advanced Fire Control Systems (FCS) that automate targeting based on coordinates from any command and control system, streamlining mission execution.

### Precision Strikes with Minimal Collateral Damage

Modern mortar systems have significantly evolved to meet the complex demands of contemporary warfare. Once primarily used for suppressive fire, they now deliver pinpoint strikes on high-value targets with enhanced precision and targeting capabilities. Advances in GPS-guided munitions and fire control systems have markedly increased their accuracy and lethality. These advancements enable rapid deployment in dynamic battlefield environments, minimising collateral damage and enhancing their strategic value.

These mortars offer a high degree of automation, which significantly reduces the need for manual input during operations. This not only speeds up the firing process but also decreases the margin for human error, resulting in more efficient and effective battlefield support. The increased automation also reduces the training burden on soldiers, allowing them to focus on more strategic tasks and less on operating the mortar.

Unlike direct-fire systems, which require the weapon to be aimed directly at the target, these mortar systems are designed for indirect fire. This means they can engage targets that are concealed behind natural or man-made obstacles, such as hills, buildings, or other terrain features, without the need for a direct line of sight. This capability provides significant tactical advantages in complex or urban

environments, where the ability to attack hidden or hard-to-reach targets is crucial. The mortar systems can be employed to support infantry units by neutralising enemy positions, countering artillery, or providing fire support for forces operating in difficult terrain, all while keeping the mortar crews relatively safe from direct enemy return fire. The flexibility and versatility of indirect fire make mortars an essential tool in modern military operations.

GDAMS also leverages digital technology to enhance its role within the battlefield kill chain. Its integration with network systems allows for faster target acquisition, data sharing, and coordination, making it a key element of any digitalised warfare strategy.

### Enhancing Crew Safety and Efficiency

In hostile environments, the safety of operating crews is paramount, and mortar systems have historically posed risk to crews due to the combustion gases and pressure waves generated by the blast of the gun. As a result, especially for guns of 120 mm calibre or greater, the operator of the gun must station himself at a safe distance from the blast area, by remotely triggering the mortar firing to avoid injuries due to the blast overpressure generated when fired. However, this method results in a significant reduction in the rate of fire. The problem is accentuated by the development of modern mortar systems that are designed for high rates of fire with semi-automatic bomb loading systems.

One of the standout innovations in the GDAMS and SRAMS MkII is the patented blast diffuser technology. This innovation significantly reduces the harm from the crew by channelling the combustion gases to escape from a series of chambers in the blast diffuser, away from the crew, thus



SRAMS on Bronco



GDAMS is suitable for integration with any lightweight commercial vehicle or 4 x 4 military-class wheeled vehicle.





GDAMS in action



Fully digitalised mission assignment and execution

reducing the gas pressure significantly before the munition leaves the barrel. This allows safer operations under high-intensity conditions and protects the personnel while also minimising the noise exposure by threefold and threat detection of the system. The efficient requirement for just a two-person crew to operate significantly reduces manpower needs without sacrificing firepower. This streamlined setup enhances operational efficiency and survivability during missions.

### The Future of Artillery and Mortar Systems

As modern militaries grapple with the challenge of upgrading legacy systems while adapting to rapid technological changes, the need for solutions that bridge the gap between old and new is paramount. Many traditional mortar systems struggle to meet the precision, range, and versatility demanded in contemporary combat.

In partnership with Babcock, ST Engineering is delivering an end-to-end solution for the GDAMS, which includes the manufacturing, support, and training needed to equip armed forces with the most advanced mortar technology available. This collaboration ensures a seamless integration of these cutting-edge systems into military operations, offering comprehensive solutions from initial build to ongoing operational support and training.

Advanced systems like GDAMS are designed to address these needs

directly by bridging the gap between traditional and modern capabilities. The system's modular architecture enables seamless compatibility with the existing equipment, extending the life and effectiveness of legacy systems while simultaneously upgrading them with next-generation capabilities. This hybrid approach minimises costs and disruption, enabling militaries to leverage existing stockpiles and infrastructure.

With defence budgets under scrutiny, many governments are seeking solutions that balance cost-efficiency with cutting-edge capabilities. The versatility of 120mm mortars, capable of deploying both traditional and precision-guided munitions, positions them as an attractive option for enhancing tactical flexibility without a complete overhaul of existing systems. Advanced mortar systems like GDAMS reflect the broader trend towards modularity and adaptability in military technology, allowing nations to enhance their competencies without entirely replacing legacy systems, while simultaneously improving overall combat readiness through a rapid transition to next-generation warfare capabilities.

As geopolitical tensions and battlefield dynamics continue to shift, innovative solutions will play a critical role in ensuring that armed forces remain prepared to confront the complexities of today's unpredictable warfare landscape.



[www.stengg.com](http://www.stengg.com)



## RESPONSIVE FIREPOWER ON THE MOVE FOR INFANTRY

The Ground Deployed Advanced Mortar System (GDAMS) is a lightweight mortar system for rapid deployment with patented blast diffuser technology to enhance crew safety.

### Key Features

- Suitable for integration with any lightweight commercial vehicle or 4x4 military-class wheeled vehicle
- Rapid deployment and retrieval for survivability
- Automated alignment of mortar system using target co-ordinates from any C2 System
- Digital mission assignment and execution

