



KEEPING CREW SAFE – FROM ABOVE

A manual turret: Gunner protection for personnel carriers

Addressing a problem and fulfilling a market demand

Personnel carriers vulnerable to hostile fire

Typically, personnel carriers do exactly as the name suggests – they are armoured vehicles designed and equipped to transport troops to and from operational deployments. However, increasingly, these vehicles traverse combat scenarios without the availability of fitted armament to offer defence. A complete vehicle re-design to integrate armament is a costly exercise.

The CSIR has developed a turret that can be installed on an existing armoured personnel carrier to contain a firing crew and a variety of weapons. The turret provides relative safety for the gunmen, offers a 360° firing range and is lightweight enough to avoid adding an unnecessary weight burden to the vehicle.

The technology on offer

Adding lethality to troop carriers under threat

The CSIR developed a turret that can be used on the Mamba Mk III used by the South African National Defence Force (SANDF). Mounted on the roof of the vehicle, the turret provides an arc of fire of 360° and offers protection for the gunner from small arms fire. The SANDF requirement was for the turret to render the same ballistic protection levels as the

Mamba Mk III's crew compartment. The turret is rotated manually (not motorised as most are) to allow for the gunner to have control of the arc of fire.

The design of the turret is unique; it allows for multi-weapon mounts, is robust yet lightweight, and the unit can be retrofitted to any personnel carrier such as those used in peace-keeping efforts with the African Union and border safeguarding.

Value proposition and competitive advantage

Retrofitting to add firepower to existing platforms

The 360° manual turret is a unique design that can be retrofitted to existing armoured personnel carriers and is deemed to be a robust and cost-effective solution to enhance the capability of existing vehicles. Typically, turrets are installed by original equipment manufacturers, designed specifically for their vehicles.

Globally, the manual turret can be fitted to several vehicles, including the Mamba, Casspir and Casspir NG2000, Mbombe-4, Maatla, Marauder, Nyoka and the Maverick.

Market opportunity

Opportunities for local and global sales

The potential market size for the manual turret is approximately R1.4 billion at an estimated unit price of R400 000 per turret.

A preliminary estimate of potential demand for the turret to be retrofitted to armoured personnel carriers is approximately 3 500 units globally. This includes the South African market as well as the Southern African Development Community, the rest of Africa and the rest of the world. A foothold already exists in the local market.

The CSIR can assist with custom design modifications, should this be required in a particular installation.

Business opportunity

Technology development and vehicle production partnership

It is estimated that approximately R25 million is required to support the commercialisation of the 360° manual turret. A phased-gate funding approach is proposed towards commercialisation. The total commercialisation project funding estimate includes local partner development. It is envisaged that a local partnership with entities that have relevant manufacturing capabilities is established for the production of the Mamba turret as part of a CSIR supplier development initiative.

The funding requirement for the first phase is R5 million to cover, among others, business development, design enhancement, detailed data pack finalisation, quality management and risk assessment. The commercialisation process as envisaged, is expected to be completed within two years.

A team of experts in mechanics, vehicle mobility and operational deployment

CSIR experts in landward sciences have vast experience in understanding the mobility scenarios, requirements and challenges faced by troops in



The CSIR-developed turret can be retrofitted to a range of different personnel carriers to provide protection to the gunner and a 360° arch of fire.

operational deployments on the continent. Vehicle development and validation have been performed at the CSIR for over five decades. Aside from the scientific and mechanical know-how, the team has access to a range of developmental laboratories, workshops and vehicle testing sites.

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